

## ColorCote® ZinaCore™ (formerly ZR8)

Conforms to AS/NZS 2728:2013 Product type 4 (Table 1.1).  
Suitable for ISO 9223 Atmosphere Classifications C1-C3

### Description

A high durability product with improved cut edge performance designed to give excellent colour retention and high formability at moderate cost.

### Substrate

Hot dipped Aluminium/Zinc/alloy coated steel coil ZA150 coat weight. Manufactured to AS 1397:2011. Steel grade either G550 or G300.

### Pretreatment

Corrosion resistant chromate conversion coating.

### Primer

Flexible corrosion resistant chromated primer.

### Finish Coat

Flexible exterior acrylic, polyester. Film thickness Nominal 18 microns.

**Note:** the finish coat can be applied to one or both sides of the sheet in the same or different colours. Colours outside the standard range may be available depending on colour and quantity.

### Backing Coat

Shadow Grey (standard colour) wash coat 5 microns thickness.

### Gloss

Typical gloss levels are 25%, measured in accordance with ASTM D523-89 (60 degrees). The Naturals colour range (G10) uses a lower gloss level of a nominal 10% which is available in the ZinaCore™ range.

### Strippable Film

Products can be supplied with an optional strippable protective film at extra cost. This material has a relatively short life span under exterior exposure conditions. It should be removed as soon as possible within 48 hours of outdoor exposure.

### Expected Performance

**Outdoor Durability:** ColorCote® ZinaCore™, under well washed conditions of exposure, is expected to show no cracking (other than that which may occur during forming), flaking or peeling of the paint film for 15 years from date of installation.

Colour change during service will depend on the colour chosen, aspect, design of the structure and the environment. Maximum colour change levels of ColorCote® ZinaCore™ colours in normal environments after 10 years service are given in warranty documentation. Colour change is measured using an instrumental colour spectrophotometer, according to ASTM D-2244-93, and determined on clean surfaces, free of all dirt, chalk, oxidised film, oil, grease and other foreign contaminants.

Some chalking may occur. A maximum rating of 2 is expected after 10 years exposure, when measured in accordance with AS/NZS 1580.481.1.11:1998. Scale is between 0 and 5 with a lower number indicating less chalking.

## Handling and Roll-Forming

To avoid damaging the paint surface the material must be handled carefully during transport and roll-forming. Pacific Coilcoaters does not recommend the use of roll-forming lubricants on ColorCote® products, as they will affect performance of pre-painted steel and will lead to staining and uneven premature fading.

### Typical Properties

- Mar Resistance: Good
- Scratch Resistance: Good
- Impact Resistance: (AS/NZS 2728 Appendix E) – Greater than 10 Joules
- Pencil Hardness: (AS/NZS 1580.405.1) – F minimum
- Bend Test: (AS/NZS 2728 Appendix F) – No loss of paint adhesion when bent around a diameter equal to five times the thickness of the sheet.
- Heat Resistance: Suitable for continuous service up to 100°C. Continuous service at higher temperatures may cause some colour change of the paint film.

Index	Rating	Range
Ignitability Index	0	0-20
Spread of Flame Index	0	0-10
Heat Evolved Index	0	0-10
Smoke Developed Index	0-2	0-10

### Accelerated Corrosion Tests

(Tests are conducted on a flat panel.)

#### Salt Spray

Meets the requirements of AS/NZS 2728:2013 Sections 2.8 and 2.10

#### Humidity Resistance

Meets the requirements of AS/NZS 2728:2013 Sections 2.8 and table 2.9

#### QUV Resistance

Meets the requirements of AS/NZS 2728:2013 Sections 2.8 and table 2.4

### Chemical Resistance

ZinaCore™ has good resistance to accidental spillage of solvents such as methylated spirits, mineral turpentine, toluene, trichloroethylene and dilute acids and alkalis. All spillages should be removed immediately by wiping or washing.

### Recommended End Uses

Exterior uses where there is a high risk of accelerated corrosion. It has very good colour and gloss retention and is suitable for roofing, cladding, rainwater goods and garage doors. For information concerning product use in areas not covered by ColorCote® ZinaCore™ refer to the ColorCote® ZinaCore™ X and / or AlumiGard™ X technical brochures or contact Pacific Coilcoaters for details. ZinaCore™ is not suitable for use as watertanks or areas where a constantly wet environment is maintained or in constantly running water or in contact with soil.

### Site Practice

If nestable profiles become wet while closely stacked, formation of wet storage stain or 'white rust' is inevitable. To minimise the possibility of inadvertent contamination:

- Inspect deliveries on arrival. If moisture is present, individual sheets should be dried immediately with a clean rag and then stacked to allow air to circulate and complete the drying process.
- Well ventilated storage is essential. Always store metal products under cover in clean, well-ventilated buildings.
- Cross-stack or fillet sheets where outside storage is unavoidable and make provision for a fall to allow water to run off.

It is the responsibility of the roofing contractor to avoid damaging the roof sheeting during its installation and fixing. Never drag sheets from a pile. Remove by 'turning' off the stack. Lift sheets onto a roof, and do not drag over the eaves or purlins. Use clean footwear, remove swarf and other contaminants regularly. For further information refer to the MRM Code of Practice.

### Touch Up Paint

ColorCote® is a baked on paint system which has different weathering characteristics to standard air drying paints. Do not use touch up paint on ColorCote® products. Minor scratches should be left alone.

### Clean Up

Installation procedures involving self-drilling screws, drills and hacksaws etc. will leave deposits of swarf and metal particles. These particles including blind rivet shanks, nails and screws should be swept and washed from the roof at the end of each day.

### Dissimilar Materials

When dissimilar metals come into contact with each other, the electric potential difference between the metals establishes a corrosion cell and accelerated corrosion can occur. To avoid this problem the following precautions should be observed:

- Avoid discharges of water from brass or copper pipes onto ColorCote® ZinaCore™.
- Do not use non-galvanised steel, copper, stainless steel or Monel metal in direct contact with ColorCote® ZinaCore™.
- Do not use lead flashings in contact with ColorCote® ZinaCore™ products. Soft edge aluminium, or notching of flashings, are the best solutions.
- Do not use tanalised timber in direct contact with ColorCote® ZinaCore™ products. Use PVC tape or similar barrier to isolate potential problem points of contact between materials.

ColorCote® ZinaCore™ products are not suitable for use in the following situations:

- Animal shelters, where excessive ammonia fumes can accumulate due to inadequate venting, or where direct contact with animal effluent can occur.
- Water tanks or areas where a constantly wet environment is maintained.
- In direct contact with concrete, or where lime deposits are evident.
- In contact with soil. (Allow 75mm run off below cladding sheets to ground level.)

### Fastenings

Match corrosion resistance of the fastenings with the service life of the chosen ColorCote® ZinaCore™ product. Class 4 coated screws will give best service life with ColorCote® ZinaCore™.

Do not use stainless or Monel fasteners on ColorCote® ZinaCore™ products. Aluminium rivets should be used for best results. For further details refer to the MRM Code of Practice.

### Sealing and Jointing

Where sealed joints are required, use only neutral cure silicon rubber sealant, together with mechanical fasteners, such as aluminium rivets. Do not solder or weld ColorCote® products.

### Unwashed Areas

These are typically those areas that are not washed by natural rainfall, such as the underside of unsarked overhanging roofing and recessed doorways in commercial cladding, tops of garage doors etc. These areas are excluded from warranty. Pacific Coilcoaters recommends the exclusion of unwashed areas by design wherever possible. In cases where this is not possible, then a regular washing programme should be put in place. Airborne contaminants should be removed by water blasting or mechanical washing with water and a soft nylon brush for best results at least every 6 months, or more frequently in severe environments.

### Roof Pitch

Do not use a pitch less than 3° to avoid ponding and premature degradation of the coating system.

## ColorCote® ZinaCore™ X (formerly ZRX)

Suitable for ISO 9223 Atmosphere Classification C1-C4 as per AS/NZS 2728:2013.

### Description

A high durability product with improved cut edge performance designed to give excellent colour retention and high formability at moderate cost.

### Substrate

Hot dipped Aluminium / Zinc steel coil AZ150 coating weight. Manufactured to AS 1397:2011 steel grade either G550 or G300.

### Pretreatment

Corrosion resistant chromate conversion coating.

### Primer

Highly corrosion resistant high build primer both sides. Nominal film thickness  $15\ \mu\text{m} \pm 2\ \mu\text{m}$  on the topside and  $10\ \mu\text{m} \pm 2\ \mu\text{m}$  on the reverse.

### Finish Coat

70% PVF<sub>2</sub> system. Nominal film thickness  $20\ \mu\text{m} \pm 2\ \mu\text{m}$ .

**Note:** the finish coat can be applied to one or both sides of the sheet in the same or different colours. Colours outside the standard range may be available depending on colour and quantity.

### Backing Coat

Shadow Grey (standard colour) wash coat 5 microns thickness.

### Gloss

Typical gloss levels are 25%, measured in accordance with ASTM D523-89 (60 degrees). Non standard gloss levels may be available on application.

### Strippable Film

Products can be supplied with an optional strippable protective film at extra cost. This material has a relatively short life span under exterior exposure conditions. It should be removed as soon as possible within 48 hours of outdoor exposure.

### Expected Performance

**Outdoor Durability:** ColorCote® ZinaCore™ X, under normal well washed conditions of exposure, is expected to show no cracking (other than that which may occur during forming), flaking or peeling of the paint film for 15 years from date of installation.

Colour change during service will depend on the colour chosen, aspect, design of the structure and the environment. Maximum expected colour change levels of ColorCote® ZinaCore™ X colours in moderate environments after 15 and 20 years of service are given in warranty documentation. Colour change is measured using an instrumental colour spectrophotometer, according to ASTM D-2244-93, and determined on clean surfaces, free of all dirt, chalk, oxidised film, oil, grease and other foreign contaminants.

Some chalking may occur. A maximum rating of 2 is expected after 20 years exposure, when measured in accordance with AS/NZS 1580.481.1.11:1998. Scale is between 0 and 5 with a lower number indicating less chalking.

## Handling and Forming

To avoid damaging the paint surface the material must be handled carefully during transport and roll-forming. Pacific Coilcoaters does not recommend the use of roll-forming lubricants on ColorCote® products, as they will affect performance of pre-painted steel and will lead to staining and uneven premature fading.

## Typical Properties

- Mar Resistance: Fair
- Scratch Resistance: Fair
- Impact Resistance: (AS/NZS 2728 Appendix E) – Greater than 10 Joules
- Pencil Hardness: (AS/NZS 1580.405.1) – F minimum
- Bend Test: (AS/NZS 2728 section 2.6 and Appendix F) – No loss of adhesion or paint cracking when bent around a diameter equal to five times the thickness of the sheet.
- Heat Resistance: Suitable for continuous service up to 100°C. Continuous service at higher temperatures may cause some colour change of the paint film.

Index	Rating	Range
Ignitability Index	0	0-20
Spread of Flame Index	0	0-10
Heat Evolved Index	0	0-10
Smoke Developed Index	0-2	0-10

## Accelerated Corrosion Tests

(Tests are conducted on a flat panel.)

### Salt Spray

Meets the requirements of AS/NZS 2728:2007 sections 2.8 and 2.10

### Humidity Resistance

Meets the requirements of AS/NZS 2728:2007 sections 2.8 and table 2.9

### QUV Resistance

Meets the requirements of AS/NZS 2728:2007 sections 2.8 and table 2.4

## Chemical Resistance

Good resistance to accidental spillage of solvents such as methylated spirits, white spirits, mineral turpentines, toluene, trichlorethylene and dilute acids and alkalis. All spillages should be immediately removed by wiping or washing.

## Recommended End Uses

Exterior uses where high formability, such as crimp curving after roll forming, excellent colour and gloss retention is required. It is suited to environments such as severe marine, geothermal and industrial sites where there is a high risk of corrosion due to corrosive elements in the atmosphere.

For information concerning product use in areas not covered by ColorCote® ZinaCore™ X refer to the ColorCote® MagnaFlow™ X AlumiGard™ X technical information brochure or contact Pacific Coilcoaters for details.

## Site Practice

If nestable profiles become wet while closely stacked, formation of wet storage stain or 'white rust' is inevitable.

To minimise the possibility of inadvertent contamination:

- a) Inspect deliveries on arrival. If moisture is present, individual sheets should be dried immediately with a clean rag and then stacked to allow air to circulate and complete the drying process.
- b) Well ventilated storage is essential. Always store metal products under cover in clean, well-ventilated buildings.
- c) Cross-stack or fillet sheets where outside storage is unavoidable and make provision for a fall to allow water to run off.

It is the responsibility of the roofing contractor to avoid damaging the roof sheeting during its installation and fixing. For light gauges and large purlin spacings, never drag sheets from a pile. Remove by 'turning' off the stack. Lift sheets on to a roof, and do not drag over the eaves or purlins.

## Touch Up Paint

ColorCote® is a baked on paint system which has different weathering characteristics to standard air drying paints. Do not use touch up paint on ColorCote® products. Minor scratches should be left alone.

## Clean Up

Installation procedures involving self-drilling screws, drills and hacksaws etc. will leave deposits of swarf and metal particles. These particles including blind rivet shanks, nails and screws should be swept and washed from the roof at the end of each day.

## Dissimilar Materials

When dissimilar metals come into contact with each other, accelerated corrosion can occur. To avoid this problem the following precautions should be observed:

- Avoid discharges of water from brass or copper pipes onto ColorCote® ZinaCore™ X.
- Do not use non-galvanised steel, copper, stainless steel or Monel metal in direct contact with ColorCote® ZinaCore™ X.
- Do not use lead flashings in contact with ColorCote® ZinaCore™ X products. Soft edge aluminium, or notching of flashings, are the best solutions.
- Do not use tanalised timber in direct contact with ColorCote® ZinaCore™ X products. Use PVC tape or similar barrier to isolate potential problem points of contact between materials.

ColorCote® ZinaCore™ X products are not suitable for use in the following situations:

- Animal shelters, where excessive ammonia fumes can accumulate due to inadequate venting, or where direct contact with animal effluent can occur.
- Water tanks or areas where a constantly wet environment is maintained.
- In direct contact with concrete, or where lime deposits are evident.
- In contact with soil. (Allow a 75mm run off below cladding sheets to ground level.)

## Fastenings

Match corrosion resistance of the fastenings with the service life of the chosen ColorCote® product. Galvanised nails should not be used on ZinaCore™ X. Class 4 coated screws are the minimum for ZinaCore™ X roofing and cladding in severe environments.

Do not use stainless or Monel fasteners on ColorCote® ZinaCore™ X products. Aluminium rivets should be used for best results. For further details consult your fastening suppliers.

## Sealing and Jointing

Where sealed joints are required, use only neutral cure silicon rubber sealant, together with mechanical fasteners, such as aluminium rivets. Do not solder or weld ColorCote® products.

### **Unwashed Areas**

These are typically those areas that are not washed by natural rainfall, such as the underside of unsarked overhanging roofing and recessed doorways in commercial cladding, tops of garage doors etc. These areas are excluded from warranty. Pacific Coilcoaters recommends the exclusion of unwashed areas by design wherever possible.

In cases where this is not possible, then a regular washing programme should be put in place. Airborne contaminants should be removed by water blasting or mechanical washing with water and a soft nylon brush for best results at least every 6 months, or more frequently in severe environments.

### **Roof Pitch**

Do not use a pitch less than 3°, to avoid ponding and premature degradation of the coating system.

## ColorCote® AlumiGard™ X AND AlumiGard™ (formerly ARX and AR8)

A highly durable and corrosion resistant product, with high formability, designed for roofing and cladding in very severe marine applications. Suitable for ISO 9223 Atmospheric Classification 1-5. Conforms to AS/NZS 2728: 2013 Product 6 (Table 2.1).

### Substrate

Aluminium alloy type 5052 Marine Grade for excellent corrosion resistance and very good formability (in soft temper). Alternatively, by specification, Aluminium Alloy type 5005, with lower tensile properties for customer projects requiring greater formability. Available typically in thickness 0.7, 0.9, 1.2 mm. Common widths are 610mm, 940mm, 1220mm.

Alloy	Temper	Hardness	Ultimate Tensile Strength (MPa)		Yield (MPa)	Elongation % in 50mm	Ultimate Shear (MPa)	Bend Radii (mm)	Typical Use
			Minimum	Maximum					
Mod/Elasticity 69000MPa								Internal	
5005	H32	Quarter	115	160	85	5	97	1t	Lockseam
5005	H34	Half	135	180	105	4	97	1t	Folding
Mod/Elasticity 69000MPa									
5052	H32	Quarter	215	265	160	5	138	1t	Lockseam
5052	H34	Half	235	285	180	4	145	2t	Folding and Crimping
5052	H36	Three Quarter	255	305	200	3	159	2t	Rollforming
5052	H38	Fully Hard	270		220	3	165	3t	Rollforming

Note: typical stocking of 5052 alloy H36, allows both roll forming of trapezoidal and corrugates, and can also be used in the manufacture of flashings.

### Composition of Alloys

Alloy	Si	Fe	Cu	Mn	Mg	Cr	Zn	Other	AL
5005	0.30%	0.70%	0.20%	0.20%	0.5-1.1%	0.10%	0.25%	0.15%	Remainder
5052	0.25%	0.40%	0.10%	0.10%	2.2-2.8%	0.15-0.35%	0.10%	0.15%	Remainder

Note: higher chrome and magnesium levels increase tensile strength and corrosion resistance.

### Bend Radii

Minimum recommended substrate bend radii for 90 degree cold bends at right angle to rolling direction, without substrate cracking, however T bends should be at least double this to avoid over stressing the paint coating.

Bend Test: No loss of adhesion of paint cracking when bent around a diameter equal to 5 times the thickness of the sheet.

### ColorCote® AlumiGard™ X and AlumiGard™ Paint Coating Specifications

Nominal film thickness 25 microns.

#### Pretreatment

Corrosion resistant chromate conversion coating.

#### Primer

Highly corrosion resistant polyester primer on both sides.

#### Finish Coat

AlumiGard™ X: PVF<sub>2</sub> system. AlumiGard™: Acrylic or polyester system.

#### Backing Coat

Shadow Grey (standard colour) or Foam Grey on request for use with adhesives for laminating.

#### Finish Coat

- AlumiGard™ X: Nominal film thickness of 20 microns PVF<sub>2</sub> providing good resistance to chemical attack, and excellent colour retention.
- AlumiGard™: Nominal film thickness of 20 microns.
- AlumiGard™ is available in an extensive range of colours beyond the AlumiGard™ X colour range.



The finish coat can be applied to one or both sides of the sheet in the same or different colours. Colours outside the standard range may be available depending on colour and quantity.

### Expected Performance

ColorCote® AlumiGard™ X and AlumiGard™ Aluminium is an excellent solution for roofing and cladding in Very Severe environments. It is ideal for open-ended soffits and canopies.

Should the paint deteriorate in a particular spot due to attack or mechanical damage, the surrounding product will not delaminate as a result of the film being broken as the paint film is a breathing membrane which can be overpainted later in the life of the building.

ColorCote® AlumiGard™ X and AlumiGard™ Aluminium is recyclable, should sheets be damaged or perforated at a later stage in the life of the building.

### Outdoor Durability

ColorCote® AlumiGard™ X and AlumiGard™, under normal well washed conditions of exposure, can be expected to show no cracking (other than that which may occur during forming), flaking or peeling of the paint film in 15 years.

### Handling and Roll-Forming

To avoid damaging the paint surface the material must be handled carefully during transport and roll-forming. Pacific Coilcoaters does not recommend the use of roll-forming lubricants on ColorCote® products.

### Strippable Film

Products can be supplied with an optional strippable protective film at extra cost. Light colours must use strippable film to prevent marking during roll-forming. Strippable film should be removed just before or just after product installation or within 12 months of delivery from Pacific Coilcoaters.

### Typical Properties

- Mar Resistance: Fair
- Scratch Resistance: Fair
- Impact Resistance: (AS/NZS 2728 Appendix E) – Greater than 10 Joules
- Pencil Hardness: (AS/NZS 1580.405.1) – F minimum
- Bend Test: (AS/NZS 2728 Appendix F) – No loss of adhesion or paint cracking when bent around a diameter equal to five times the thickness of the sheet.
- Heat Resistance: Suitable for continuous service up to 100°C. Continuous service at higher temperatures may cause some colour change of the paint film.

Index	Rating	Range
Ignitability Index	0	0-20
Spread of Flame Index	0	0-10
Heat Evolved Index	0	0-10
Smoke Developed Index	0-2	0-10

For exact specification consult your rollformer.

ColorCote® AlumiGard™ X generally performs well in

- Salt-laden environments
- Timber processing areas
- Milk treatment facilities
- Fish processing plants

### Rainwater Collection

Rainwater collected from roofs clad with products made from ColorCote® AlumiGard™ X and AlumiGard™ prepainted aluminium will comply with the provisions of NZBC G12.3.1, provided the water is not contaminated from other sources. The first 25mm of rainfall from a newly installed roof must be discarded before drinking water collection starts.

## Corrosion Resistance

In very aggressive environments, ColorCote® AlumiGard™ X and AlumiGard™ will give increased protection from atmospheric attack, as the paint surface then acts as further protection between the aluminium and the atmosphere. Care should be taken to avoid galvanic attack when pre-painted aluminium is used in conjunction with certain other materials. Flashings should be aluminium, and fastenings should be aluminium or austenitic stainless steel.

### Steel:

- Where pre-painted aluminium is laid on steel purlins, the two surfaces must be isolated by an inert membrane.

### Wood:

- Unseasoned wood and certain treated timbers may contain acids or chemicals which can cause galvanic corrosion. In mild atmospheres it is enough to seal the timber surface with an inert membrane at the points of contact with the pre-painted aluminium. In aggressive conditions, the two surfaces should be isolated by a gasket of rubber, neoprene or bituminous roofing felt.

### Concrete & Plaster:

- The structural properties are not significantly affected by contact with these materials. However, there may be some discolouration especially in wet conditions. The pre-painted aluminium sheet should therefore be protected by an inert membrane at the points of contact.

### Cement:

- Wet cement may have a corrosive effect on AlumiGard™ X and AlumiGard™, and care should be taken to avoid cement splashes falling on the sheet. Where this occurs, it should be cleaned off as soon as possible.

### Copper:

- In no circumstances should pre-painted aluminium be used in contact with copper or copper alloys, as the pre-painted aluminium will corrode very quickly.

Where water runs off copper on to pre-painted aluminium there will also be rapid corrosion, so care must be taken to avoid this.

For information related to the general specification, application and maintenance of ColorCote® products refer to the ColorCote® General Information Guide.

## Site Practice

If nestable profiles become wet while closely stacked, formation of wet storage stain or 'white rust' is inevitable.

To minimise the possibility of inadvertent contamination:

- Inspect deliveries on arrival. If moisture is present, individual sheets should be dried immediately with a clean rag and then stacked to allow air to circulate and complete the drying process.
- Well ventilated storage is essential. Always store metal products under cover in clean, well-ventilated buildings.
- Cross-stack or fillet sheets where outside storage is unavoidable and make provision for a fall to allow water to run off.

It is the responsibility of the roofing contractor to avoid damaging the roof sheeting during its installation and fixing. For light gauges and large purlin spacings, never drag sheets from a pile. Remove by 'turning' off the stack. Lift sheets on to a roof, and do not drag over the eaves or purlins.

## Touch Up Paint

ColorCote® is a baked on paint system which has different weathering characteristics to standard air drying paints. Do not use touch up paint on ColorCote® products. Minor scratches should be left alone.

## Clean Up

Installation procedures involving self-drilling screws, drills and hacksaws etc. will leave deposits of swarf and metal particles. These particles including blind rivet shanks, nails and screws should be swept and washed from the roof at the end of each day.

## ZINCALUME®

The Zincalume® coated steel coating has been formulated to give a significantly longer service life than a galvanised coating. This is of particular value in New Zealand where the prevailing winds carry corrosive salt laden air many kilometres inland.

Zincalume® coated steel is produced by a continuous hot dip process similar to that used to manufacture galvanised steel. While both Zincalume® steel and galvanised steel products have a steel base, galvanised steel has a coating of 100% zinc, whereas Zincalume® steel has an alloy coating of 43.5% zinc, 55% aluminium and 1.5% silicon.

The Zincalume® alloy coating weight is 150g/m<sup>2</sup> (AZ150) covering both sheet surfaces and the steel substrate grade is either G550 or G300.

The Zincalume® steel product has an attractive finely spangled silvery matt appearance. Zincalume® steel is recommended for the manufacture of:

- Roofing and flashings
- Wall cladding
- Gutters and downpipes
- Fences
- Steel house frames
- Garage doors
- Garden sheds
- Flues

It is formable, weldable and readily accepts paint finishes.

### Corrosion Resistance

Zincalume® steel has superior long-term corrosion resistance in most atmospheric conditions. This is achieved through the combination of the sacrificial protection of the zinc and the barrier protection of the aluminium.

Test sites from around the world over a period of twenty-five years have provided a wealth of information about comparative performance of galvanised and Zincalume® steel products. Test sites are placed in many different environments, ranging from typical rural, to severe marine. Corrosion rates are determined by exposing samples of Zincalume® steel and galvanised steel on standard test racks and regularly monitoring the coating performance over a number of years.

Though corrosion rates vary according to the severity of conditions, Zincalume® steel coatings out-perform galvanised coatings in almost all environments. This is particularly true in marine environments where Zincalume® steel will provide a significantly longer service life than galvanised steel.

### Painting Zincalume® Steel

Zincalume® steel is readily paintable using good quality primers and water-based acrylic topcoats. Paint manufacturers' instructions should be followed. Dirt, grease and any loose materials must be cleaned off so the surface is clean and dry prior to the first coat being applied.

### Unwashed Areas

Compared to galvanised steel, Zincalume® steel performs exceptionally well in areas not regularly washed by rainwater. However, as with any steel-based product, regular washing of areas not naturally rain-washed is essential to ensure that a satisfactory life is realised from the product.

## Rainwater Collection

Rainwater collected from roofs clad with products made from Galvsteel™, Zinalume® steel and COLOURSTEEL® prepainted steel, will comply with the provisions of NZBC G12.3.1, provided the water is not contaminated from other sources. The first 25mm of rainfall from a newly installed roof must be discarded before drinking water collection starts. Where a paint or paint system is applied to the roof, its suitability for the collection of drinking water must be established.

## Protection at Cut Edges

At the cut edge, Zinalume® steel provides similar protection to galvanised coatings. The zinc/aluminium alloy coating of Zinalume® steel provides galvanic protection to bare steel exposed at cut edges and by deep scratches.

## Passivation

Surface passivation enhances the protection of the galvanised and Zinalume® steel product during storage, forming, handling and fixing. A completely new passivation system has been developed for Zinalume® steel which offers a technical advance over the Zinalume® steel product manufactured in Australia prior to October 1993. It largely eliminates the need for roll-forming oils, offers improved wet stack corrosion resistance and generally makes the product more mark resistant during handling and fixing.

## Handling and Storage

The normal storage care, site cleanliness and installation procedures used for Galvsteel™ products apply to Zinalume® steel products.

Although passivation provides improved protection during storage, care should still be taken. If Zinalume® steel becomes wet during storage, the product should be immediately separated, wiped with a clean cloth and placed in a position where it can completely air dry.

## Forming

As with Galvsteel™, Zinalume® steel is suitable for all but the most severe forming operations.

With Zinalume® steel, the new passivation system acts as a dry lubricant and in most cases will eliminate the need for additional lubrication in most forming operations. Solvent-based lubricants must not be used.

## Welding

Zinalume® steel can be satisfactorily welded using the following techniques:

- GMA (Gas Metal-Arc, often called MIG)
- Resistance welding (spot or seam)
- MMA (Manual Metal-Arc)

When welding Zinalume® steel, excessive weld currents must be avoided. With correct welding procedures, sufficient coating is normally left on the Zinalume® steel sheet to protect the substrate from corrosion. Weld repair should be carried out by coating with a zinc-rich paint.

Adequate ventilation must be provided even though the welding of Zinalume® steel gives off fewer fumes than galvanised steel.

## Joining and Sealing

Zinalume® cannot be soldered. Join Zinalume® steel in the same ways as recommended for COLOURSTEEL® prepainted steel products. Use a neutral cure silicone rubber sealant in conjunction with mechanical fasteners such as blind rivets. Care should be exercised in the choice of rivets. Aluminium rivets are recommended. Monel, stainless steel and carbon steel rivets must not be used.

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## Fasteners

Most fasteners complying with the corrosion requirements of Australian Standard AS3566 “Screws – Self-drilling for the building and construction industry”, are suitable for use with Zinalume® steel.

- Stainless steel fasteners should not be used with Zinalume® steel or COLOURSTEEL® ENDURA® or MAXX® products in any environment.
- Lead headed nails must not be used.
- Use only low carbon (<15%) non-conductive sealing washers.

## Flashings and Accessories

Flashings and ridge capping should be manufactured from the same coating system as used for the main roof area to ensure equal durability. For COLOURSTEEL® ENDURA® or MAXX® and Zinalume® steel products, extended ridge caps, soft zinc, or practices such as cutting and notching are recommended.

Where penetration flashings are required, neoprene or silicone rubber, EPDM aluminium or soft zinc all give excellent performance.

## Marking Zinalume® Steel

Black lead pencils must never be used for marking Galvsteel™, Zinalume® steel or COLOURSTEEL® prepainted steel products. The carbon in the pencil promotes corrosion which will etch the surface, leaving a permanent mark. Use a pencil of any colour other than black.

## Information To Help You Avoid Problems

In almost all applications, Zinalume® steel will out-perform galvanised steel. There are, however, a small number of applications for which galvanised steel is more suitable.

Zinalume® steel must not be used for:

- Formwork in contact with wet concrete.
- Products to be embedded in concrete. However, where very small volumes of concrete are involved (e.g. splashes) which are able to cure quickly, there is little corrosive effect.
- Animal shelters where ammonia levels are constantly high.
- Fertiliser storage sheds and containers.
- Culverts, or where Zinalume® steel material is buried in the ground.
- Water tanks.
- Highly alkaline environments (e.g. cement manufacture).
- Coolroom products.

## Maintenance

All roofing and cladding products are subject to the cumulative effect 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 extensive manual washing.

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

Surfaces 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.

### Maintenance Recommendations for Zinalume® Used for Roofing and Wall Cladding

	Environment		
	Moderate	Severe	Very Severe
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

#### 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 roofing, including valleys, and wall cladding products. This means no moisture penetration due to product failure.
3. The New Zealand Building Code requires a durability of 5 years minimum (with maintenance) for rainwater products, gutters and downpipes. This means no perforation due to product failure.
4. 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.
5. 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.
6. In Industrial Environments, the type of pollution generated may alter the above recommendation. If in doubt, consult New Zealand Steel Limited.

New Zealand Steel Limited will not accept responsibility for propriety roofing and cladding products which do not conform to our recommendations for manufacturing, environmental use or maintenance.

## COLOURSTEEL® ENDURA®

### Product Description

New Zealand Steel manufactures a range of factory coated COLOURSTEEL® prepainted steel products to suit defined environmental conditions. The COLOURSTEEL® ENDURA® paint system consists of a Zinalume® steel substrate to which a prepainted finish system is applied. The system is designed to provide protection against corrosion in areas where moderate to severe environmental conditions are experienced. The Zinalume® steel substrates give improved corrosion resistance in most environments (particularly coastal), when compared to the performance of galvanised steel.

The steel substrate grade is either G550 or G300.

COLOURSTEEL® ENDURA® product is suitable for a wide range of rollformed roof and wall claddings, rainwater accessories and general building products.

The COLOURSTEEL® ENDURA® paint system will exceed the service life of most traditional post-painted systems.

### Durability

When rollformed, installed and maintained in accordance with New Zealand Steel's recommendations, COLOURSTEEL® ENDURA® prepainted steel is warranted by New Zealand Steel to meet the performance requirements of NZBC B2.3 (c) for a 15-year durability when used for the manufacture of roof and wall claddings.

COLOURSTEEL® ENDURA® products are expected to fade uniformly over the surface, the extent being no more than 8 Hunterlab units on the Delta E scale, and have a chalk rating of  $\leq 4$  (AS 1580 481.1.11, 1998) after 10 years exposure.

### Limitations of Use

COLOURSTEEL® ENDURA® products are not recommended for use in very severe environments, ie. within approximately 100m of breaking surf or corrosive industrial emissions. (Very severe marine environments are characterised by heavy salt deposits and the almost constant smell of salt spray in the air). Refer to New Zealand Steel's Environmental Categories Guide for further information on the definition of corrosive environments. (For very severe environments, COLOURSTEEL® MAXX® may be suitable.)

Before using COLOURSTEEL® ENDURA® products near sources of industrial pollution or in geothermal areas, consult the Technical Market Manager, New Zealand Steel.

COLOURSTEEL® ENDURA® products should not be used in the following applications:

- Embedded in concrete
- In contact with permanently wet materials
- Water tanks
- In contact with soil, bark or similar
- As concrete formwork
- In intensive animal shelters

Copper or brass pipes must not be allowed to discharge onto COLOURSTEEL® prepainted steel products or be allowed to come into contact with them. The use of other materials in proximity to COLOURSTEEL® prepainted steel products must be in accordance with New Zealand Steel Specifiers' and Builders Guide booklet. Mixing of brands of pre-painted material on the same building is not recommended by New Zealand Steel Limited.

The reaction between Zinalume® steel and lead flashings will degrade the Zinalume® steel material. Soft zinc or aluminium flashings should be used. Marking with lead pencils is not advised, and sealing washers should be low carbon - nonconducting. Refer to New Zealand Steel's Installers' Information booklet, "Marking Cutting and Drilling" section.

## Maintenance

Areas of COLOURSTEEL® ENDURA® not regularly washed with rainwater, such as wall claddings, unwashed areas and areas of high risk must be routinely washed to remove surface deposits to ensure satisfactory life is obtained from the product. Specific maintenance recommendations are given in the following table.

### Maintenance Recommendations for COLOURSTEEL® ENDURA® Used for Roofing and Wall Cladding

	Environment		
	ISO Category 3	ISO Category 4	ISO Category 5
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

## Composition

The COLOURSTEEL® ENDURA® substrate is steel strip, commonly 0.40mm or 0.55mm thick and coated with a 45% zinc, 55% aluminium alloy to a nominal coating mass of 150g/m<sup>2</sup> manufactured in accordance to AS1397 2001. A range of thicknesses, widths and strengths are available.

Following pre-treatment, a corrosion inhibitive primer, and topcoat is applied to the outer surface and a backer to the reverse side. These coatings are oven cured to provide colour and corrosion performance.

## Appearance

COLOURSTEEL® ENDURA® products are available in a range of colours. The backer coat is a light grey.

## Identification

COLOURSTEEL® ENDURA® product is identified by a brand applied to the reverse surface, indicating product type and date of manufacture.

## Installation

Full installation details for COLOURSTEEL® ENDURA® product is contained in the New Zealand Steel Installers' Guide.

## Fixings

- Aluminium and factory painted fixings are acceptable.
- Stainless steel, Monel or other copper alloy fixings must not be used.
- Lead-head nails must not be used.
- Fixings that comply with AS3556 class 3 or 4 are acceptable.

## Sealing and Joining

- Use only neutral-cure silicone rubber sealants.
- Do not use abrasive cutting wheels.
- Do not weld, braze or solder COLOURSTEEL® prepainted steel products.

Touch-up paints should not be used, as air-drying paints have different weathering characteristics to the COLOURSTEEL® prepainted steel coating.



Clean up – all debris (particularly from roofing installation) must be removed from COLOURSTEEL® ENDURA® product surfaces at the end of each day's work. Take care not to damage the coating when removing sharp fixing debris.

### External Moisture

COLOURSTEEL® ENDURA® roof cladding must be installed at a minimum of 3° or over the minimum pitch given for the profile by the manufacturer, whichever is greater. Factors likely to affect the resistance of COLOURSTEEL® ENDURA® prepainted steel to external moisture include the quality of the installation, the severity of the climate, roof configuration, material profile and the design and execution of junctions between similar materials and other elements.

### Rainwater Collection

Rainwater collected from roofs clad with products made from Galvsteel™, Zinalume® steel and COLOURSTEEL® prepainted steel, will comply with the provisions of NZBC G12.3.1, provided the water is not contaminated from other sources. The first 25mm of rainfall from a newly installed roof must be discarded before drinking water collection starts. Where a paint or paint system is applied to the roof, its suitability for the collection of drinking water must be established.

### Spread of Fire

COLOURSTEEL® ENDURA® prepainted steel comprises a combustible surface adhered to a non-combustible substrate. Used on roofs, it meets the requirements of NZBC C3/AS1 in all-purpose groups. Refer to C3/AS1 Section 4.0 External Walls and Roofs which covers vertical and horizontal spread of fire.

### Hazardous Building Materials

The use of roofing and wall claddings manufactured from COLOURSTEEL® ENDURA® prepainted steel in accordance with New Zealand Steel's instructions will meet the non-hazardous performance requirements of NZBC F2.3.1.

### Handling and Storage

If COLOURSTEEL® prepainted steel products are to be stored for any time prior to forming or installation, they must be stored in dry, well-ventilated conditions. Storage which allows water, (including condensation) to be trapped between the sheets may damage the coating beyond repair. COLOURSTEEL® ENDURA® products must be handled carefully during transport, fabrication and fixing to avoid damaging the surface.

### Availability

COLOURSTEEL® ENDURA® prepainted steel is available ex stock from most roofing distributors in a range of colours. Where a colour is not available, delivery is normally within 1-4 weeks, depending on the location of the distributor.

### Serviceable Life

The COLOURSTEEL® ENDURA® coating can be repainted to extend its serviceable life. Contact New Zealand Steel for recommendations on overpainting weathered COLOURSTEEL® products.

### Accreditation

The New Zealand Steel paintline is accredited to ISO9001.

## COLOURSTEEL® MAXX®

### Product Description

New Zealand Steel manufactures a range of factory coated COLOURSTEEL® prepainted steel products to suit defined environmental conditions. The COLOURSTEEL® MAXX® paint system consists of an AZ200 (200g/m<sup>2</sup>) Zinalume® steel substrate to which a super polyester prepainted finish system is applied. The system is designed to provide protection against corrosion in areas where moderate to severe environmental conditions are experienced.

The steel substrate grade is either G550 or G300.

COLOURSTEEL® MAXX® product is suitable for a wide range of rollformed roof and wall claddings, rainwater accessories and general building products.

The COLOURSTEEL® MAXX® paint system will exceed the service life of most traditional post-painted systems.

### Durability

When rollformed, installed and maintained in accordance with New Zealand Steel's recommendations, COLOURSTEEL® MAXX® prepainted steel is warranted by New Zealand Steel to meet the performance requirements of NZBC B2.3(c) for a 15-year durability when used for the manufacture of roof and wall claddings.

COLOURSTEEL® MAXX® products are expected to fade uniformly over the surface, the extent being no more than 8 Hunterlab units on the Delta E scale, and have a chalk rating of ≤4 (AS 1580 481.1.11, 1998) after 10 years exposure.

### Limitations of Use

COLOURSTEEL® MAXX® products are designed for use in very severe environments, greater than 50m on the East Coast or greater than 100m on the West Coast.

Before using COLOURSTEEL® MAXX® products near sources of industrial pollution or in geothermal areas, consult the Technical Market Manager, New Zealand Steel.

COLOURSTEEL® MAXX® products should not be used in the following applications:

- Embedded in concrete
- In contact with permanently wet materials
- Water tanks
- In contact with soil, bark or similar
- As concrete formwork
- In intensive animal shelters

Copper or brass pipes must not be allowed to discharge onto COLOURSTEEL® prepainted steel products or be allowed to come into contact with them. The use of other materials in proximity to COLOURSTEEL® prepainted steel products must be in accordance with New Zealand Steel Specifiers' and Builders Guide. Mixing of brands of pre-painted material on the same building is not recommended by New Zealand Steel Limited.

The reaction between Zinalume® steel and lead flashings will degrade the Zinalume® steel material. Soft zinc or aluminium flashings should be used. Marking with lead pencils is not advised, and sealing washers should be low carbon - nonconducting. Refer to New Zealand Steel's Installers' Information booklet, "Marking Cutting and Drilling" section.

## Maintenance

Areas of COLOURSTEEL® MAXX® not regularly washed with rainwater, such as wall claddings, unwashed areas and areas of high risk must be routinely washed to remove surface deposits to ensure satisfactory life is obtained from the product. Specific maintenance recommendations are given in the following table.

### Maintenance Recommendations for COLOURSTEEL® MAXX® Used for Roofing and Wall Cladding

	Environment		
	ISO Category 3	ISO Category 4	ISO Category 5
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 6 months
Unwashed and High Risk Areas	Manual washing every 6 months	Manual washing every 3 months	Manual washing every 3 months

## Composition

The COLOURSTEEL® MAXX® substrate is steel strip, commonly 0.40mm or 0.55mm thick and coated with a 45% zinc, 55% aluminium alloy to a nominal coating mass of 200g/m<sup>2</sup> manufactured in accordance to AS1397 : 2013. A range of thicknesses, widths and strengths are available.

Following pre-treatment, a corrosion inhibitive primer, and topcoat is applied to the outer surface and a backer to the reverse side. These coatings are oven cured to provide colour and corrosion performance.

## Appearance

COLOURSTEEL® MAXX® products are available in a range of colours. The backer coat is a Bass Grey.

## Identification

COLOURSTEEL® MAXX® product is identified by a brand applied to the reverse surface, indicating product type and date of manufacture.

## Installation

Full installation details for COLOURSTEEL® MAXX® product is contained in the New Zealand Steel Installers' Guide.

## Fixings

- Aluminium and factory painted fixings are acceptable.
- Stainless steel, Monel or other copper alloy fixings must not be used.
- Lead-head nails must not be used.
- Fixings that comply with AS3556 class 3 or 4 are acceptable.

## Sealing and Joining

- Use only neutral-cure silicone rubber sealants.
- Do not use abrasive cutting wheels.
- Do not weld, braze or solder COLOURSTEEL® prepainted steel products.

Touch-up paints should not be used, as air-drying paints have different weathering characteristics to the COLOURSTEEL® prepainted steel coating.

Clean up – all debris (particularly from roofing installation) must be removed from COLOURSTEEL® MAXX® product surfaces at the end of each day's work. Take care not to damage the coating when removing sharp fixing debris.

### External Moisture

COLOURSTEEL® MAXX® roof cladding must be installed at a minimum of 3° or over the minimum pitch given for the profile by the manufacturer, whichever is greater. Factors likely to affect the resistance of COLOURSTEEL® MAXX® prepainted steel to external moisture include the quality of the installation, the severity of the climate, roof configuration, material profile and the design and execution of junctions between similar materials and other elements.

### Rainwater Collection

Rainwater collected from roofs clad with products made from Galvsteel™, Zinalume® steel and COLOURSTEEL® prepainted steel, will comply with the provisions of NZBC G12.3.1, provided the water is not contaminated from other sources. The first 25mm of rainfall from a newly installed roof must be discarded before drinking water collection starts. Where a paint or paint system is applied to the roof, its suitability for the collection of drinking water must be established.

### Spread of Fire

COLOURSTEEL® MAXX® prepainted steel comprises a combustible surface adhered to a non-combustible substrate. Used on roofs, it meets the requirements of NZBC C3/AS1 in all-purpose groups. Refer to C3/AS1 Section 4.0 External Walls and Roofs which covers vertical and horizontal spread of fire.

### Hazardous Building Materials

The use of roofing and wall claddings manufactured from COLOURSTEEL® MAXX® prepainted steel in accordance with New Zealand Steel's instructions will meet the non-hazardous performance requirements of NZBC F2.3.1.

### Handling and Storage

If COLOURSTEEL® prepainted steel products are to be stored for any time prior to forming or installation, they must be stored in dry, well-ventilated conditions. Storage which allows water, (including condensation) to be trapped between the sheets may damage the coating beyond repair. COLOURSTEEL® MAXX® products must be handled carefully during transport, fabrication and fixing to avoid damaging the surface

### Availability

COLOURSTEEL® MAXX® prepainted steel is available ex stock from most roofing distributors in a range of colours. Where a colour is not available, delivery is normally within 1-4 weeks, depending on the location of the distributor.

### Serviceable Life

The COLOURSTEEL® MAXX® coating can be repainted to extend its serviceable life. Contact New Zealand Steel for recommendations on overpainting weathered COLOURSTEEL® products.

### Accreditation

The New Zealand Steel paintline is accredited to ISO9001.

## ALUMINIUM

### a) General Characteristics

A wide variety of mechanical characteristics, or tempers, are available through various combinations of cold working and heat treatment.

A good resistance to corrosion on surfaces exposed to the atmosphere is achieved due to the formation of a thin transparent oxide film that protects the substrate from further oxidation.

Attractive appearance, low maintenance, and light weight together with reflectivity are additional features of aluminium roofing materials.

Finishes available are plain mill finish, and stucco embossed finish which reduces glare.

### b) Alloy and Temper

The four-digit system used for designating the alloys is an international one which has been adopted by all major aluminium producers. The first digit indicates the alloy group. The second digit indicates modifications of the original alloy or impurity limits. The last two digits identify the specific alloy and aluminium purity.

Alloys recommended for roofing and wall cladding products are 5052, 5005 and 5251. In particular, the magnesium and chromium content of 5052 makes this alloy appropriate for recommended use in marine environments, and this alloy is in common use in New Zealand for roofing and wall cladding products.

The temper designation describes the combination of cold working and heat treatment performed to give the material appropriate forming and end use mechanical properties. The tempers used for roofing and wall cladding products are H34 for crimp curving and folding, and H36 for rollforming.

These tempers involve strain-hardening and then low temperature heating to slightly lower the material strength and increase ductility.

### c) Material Thickness

Common thicknesses for use as roofing and wall cladding are 0.70mm, 0.90mm and 1.2mm. The 0.70mm material is easily damaged in use and should be specified with caution.

### d) Working and Finishing

All aluminium alloys work harden and gain strength during forming operations. Thus the appropriate alloy and temper must be selected to allow the appropriate degree of formability, without excessive hardening and consequent splitting.

Mechanical fasteners, whether rivets or screws, are available in aluminium. Where the use of aluminium fasteners is plainly unsuitable, e.g. self-drilling screws, stainless steel is normally regarded as the best alternative.

With correct pretreatment procedures, aluminium is an excellent substrate for applied coatings. The pretreatment uses phosphate or chromate conversion coatings to chemically remove the aluminium oxide layer.

### e) Durability

Aluminium alloys have excellent durability and corrosion resistance, but their behaviour can be influenced by the way in which they are used.

Aluminium's natural affinity with oxygen results in the formation of a transparent oxide film when aluminium is exposed to air. This film is extremely hard, chemically stable, corrosion resistant, and adheres strongly to the parent metal surface. Once formed it prevents further oxidation, and, if damaged in any way, will reform if sufficient oxygen is available.

If the surface is pitted by air-borne pollutants found in industrial or marine atmospheres (e.g. sulphuric acid, sodium chloride) the resulting chemical reaction produces a larger volume of powdered corrosion product than the volume of original pit. This seals the surface and inhibits further corrosion.

Ongoing protection against corrosion in this way requires oxygen to be available at the surface.

Therefore aluminium alloys can suffer corrosion when used in ways that prevent this, e.g. continuously wet environments like sheet end laps or under accumulated debris.

#### **f) Contact with Other Materials**

In general, direct chemical attack of aluminium only occurs when the pH is below 5 or above 8.

Contact with other metals can result in corrosion due to galvanic reactions. Copper, steel, stainless steel and lead will all cause attack of the aluminium alloy. Contact with zinc will cause the zinc to be attacked.

Entrapment of moisture between adjacent aluminium surfaces will cause water stains. The stain is a superficial condition, and the mechanical properties of the aluminium alloy are not affected. The degree of staining may be judged by the relative roughness of the stained area. If the surface is reasonably smooth the stain appearance may be able to be improved by abrading with steel wool and oil.

#### **g) Maintenance**

Regular cleaning is required to maintain an unaffected surface for good aesthetic quality in industrial and marine environments.

This can be achieved naturally by rain washing but surfaces not adequately washed by rain must be cleaned by water washing and scrubbing with a soft brush at sufficient frequency to prevent build up of salt or dirt deposits. In severe marine locations the washing frequency may be every 4-6 months for surfaces not washed by rain.

## DURACLAD®

### Product Description

Dimond Duraclad® is a heavy weight premium grade glass fibre reinforced polyester sheet profiled for use as roofing and wall cladding. It is available with a choice of surface finishes and resin types to provide maximum durability in specific environments.

Environment Type	Topside	Underside
Up to and including Very Severe Marine and Industrial (marine salt, acid*, alkali* or solvent*) from both outside and in	Gel coat	Polyester surface film

\*The specific chemical nature of the environment must be discussed with Dimond to ensure the correct resin type is chosen. Duraclad is available in a range of colours. Please contact 0800 DIMOND.

Standard material thickness is 1.7mm (nominal). Duraclad® is available in thicker sheets if required.

### Features and Benefits

- Non corrosive substrate and surface protection provides excellent durability in harsh environments.
- Available in continuous lengths limited only by transport, handling and installation considerations.
- Proven durability in buildings with uses like wool scouring, fertiliser storage, exposure to severe marine or geothermal activity, galvanising and battery acid plants, swimming pool covers.
- Suitable for service temperatures of -10°C to 50°C.
- Available in the following Dimond range of roofing and wall cladding profiles: Corrugate, Veedek® / Styleline, V-Rib, LT7, BB900, SS900, Super Six.

### Limitations of Use

Duraclad® will support combustion and require fire engineering input if intended for use where fire ratings are required.

Not intended to support foot traffic other than carefully placed foot point loads on purlin lines during installation.

Fastener corrosion may require fastener replacement before Duraclad® requires replacing.

Will require the installation of Safety Mesh under the sheeting when used as roofing on spans that exceed the scope of the load span data given in section 2.1.4 for each profile. Safety mesh should be used whenever foot traffic is expected. Whenever mesh is used under Duraclad®, a separation layer such as Dimond purlin protection strip, must be placed between the mesh and the Duraclad® to protect the sheet underside.

### Maintenance

Keep surfaces clean by regular washing.

Inspect fasteners, and replace before corrosion becomes advanced.

Aesthetic value can be restored by over painting the surface with a suitable coating system once the original surface has:

- become well weathered
- lost the top surface.

Do not use abrasive cleaners on Duraclad®.

## Handling and Storage

Care must be taken not to damage the surface films. Material should be stored so it will remain dry and not suffer damage.

## Fasteners

The correct fastener size for the sheet profile should be used (refer section 2.1.4).

The Duraclad® sheet must be pre-drilled with an oversize hole 2mm larger than the diameter of the fixing. When thermal expansion must be allowed for a larger pre-drilled hole diameter will be required. Refer Section 2.1.3.4.

The choice of fastener material must take into account the durability expected in the particular environment.

Severe internal environments may require that the screw shank is protected from contact with corrosive materials.



## ColorCote® MagnaFlow™ (formerly ZM8)

Conforms to AS/NZS 2728:2013 Product type 6 (Table 1.1). Suitable for ISO 9223 Atmosphere Classification C1-C5 as per AS/NZS 2728:2013.

### Description

A high durability product with improved cut edge performance designed to give excellent colour retention and high formability at moderate cost.

### Substrate

Hot dipped Aluminium / Zinc / Magnesium alloy coated steel coil with a minimum coating weight of 240 gms/m<sup>2</sup> coating weight (240 gms per m<sup>2</sup>).

Manufactured to AS 1397 : 2011. Steel grade either G550 or G300.

### Pretreatment

Corrosion resistant chromate conversion coating.

### Primer

Flexible corrosion resistant high build primer both sides. Nominal film thickness 5 microns on the topside and on the reverse. ±1 Micron.

### Finish Coat

Flexible exterior acrylic, polyester or modified polyester coating system. Nominal film thickness 18µm ± 1µm.

**Note:** the finish coat can be applied to one or both sides of the sheet in the same or different colours. Colours outside the standard range may be available depending on colour and quantities.

### Backing Coat

Shadow Grey (standard colour) wash coat 5 microns thickness ±1µm.

### Gloss

Typical gloss levels are 25%, measured in accordance with ASTM D523-89 (60°). Non standard gloss levels may be available on application.

### Strippable Film

Products can be supplied with an optional strippable protective film at extra cost. This material has a relatively short life span under exterior exposure conditions. It should be removed either as soon as possible within 48 hours of outdoor exposure.

### Expected Performance

Outdoor Durability: ColorCote® MagnaFlow™, under normal well washed conditions of exposure, is expected to show no cracking (other than that which may occur during forming), flaking or peeling of paint film for 15 years from date of installation.

Colour change during service will depend on the colour chosen, aspect, design of the structure and the environment. Maximum colour change levels of ColorCote® MagnaFlow™ colours in moderate (C2) environments after 10 years of service are given in warranty documentation. Colour change is measured using an instrumental colour spectrophotometer, according to ASTM D-2244-93, and determined on clean surfaces, free of all dirt, chalk, oxidised film, oil, grease and other foreign contaminants.

Some chalking may occur. A maximum rating of 2 is expected after 20 years exposure, when measured in accordance with AS/NZS 1580.481.1.11:1998. Scale is between 0 and 5 with a lower number indicating less chalking.

## Handling and Storage

To avoid damaging the paint surface the material must be handled carefully during transport and rollforming. Pacific Coilcoaters does not recommend the use of rollforming lubricants on ColorCote® products, as they will affect performance of prepainted steel and will lead to staining and uneven premature fading.

## Typical Properties

- Mar Resistance: Good
- Scratch Resistance: Good
- Impact Resistance: (AS/NZS 2728 Appendix E) – Greater than 10 Joules
- Pencil Hardness: (AS/NZS 1580.405.1) – F minimum
- Bend Test: (AS/NZS 2728 Appendix F) – No loss of paint adhesion when bent around a diameter equal to five times the thickness of the sheet.
- Heat Resistance: Suitable for continuous service up to 100°C. Continuous service at higher temperatures may cause some colour change of the paint film.

Index	Rating	Range
Ignitability Index	0	0-20
Spread of Flame Index	0	0-10
Heat Evolved Index	0	0-10
Smoke Developed Index	0-2	0-10

## Accelerated Corrosion Tests

(Tests are conducted on a flat panel).

### Salt Spray

Meets the requirements of AS/NZS 2728:2007 Sections 2.8 and 2.10

### Humidity Resistance

Meets the requirements of AS/NZS 2728:2007 Sections 2.8 and table 2.9

### QUV Resistance

Meets the requirements of AS/NZS 2728:2007 Sections 2.8 and table 2.4

## Chemical Resistance

ZinaCore™ has good resistance to accidental spillage of solvents such as methylated spirits, mineral turpentine, toluene, Trichloroethylene and dilute acids and alkalis. All spillages should be removed immediately by wiping or washing.

## Recommended End Uses

Exterior uses where there is a high risk of accelerated corrosion. It has very good colour and gloss retention and is suitable for roofing, cladding, rainwater goods. For information concerning product use in areas not covered by ColorCote® MagnaFlow™ refer to the ColorCote® ZinaCore™ X and / or AlumiGard X™ technical brochures or contact Pacific Coilcoaters for details. MagnaFlow™ is not suitable for use as watertanks or areas where a constantly wet environment is maintained or in constantly running water or in contact with soil.

## Site Practice

If nestable profiles become wet while closely stacked, formation of wet storage stain or 'white rust' is inevitable. To minimise the possibility of inadvertent contamination:

- Inspect deliveries on arrival. If moisture is present, individual sheets should be dried immediately with a clean rag and then stacked to allow air to circulate and complete the drying process.
- Well ventilated storage is essential. Always store metal products under cover in clean, well-ventilated buildings.
- Cross-stack or fillet sheets where outside storage is unavoidable and make provision for a fall to allow water to run off.

It is the responsibility of the roofing contractor to avoid damaging the roof sheeting during its installation and fixing. Never drag sheets from a pile. Remove by 'turning' off the stack. Lift sheets onto a roof, and do not drag over the eaves or purlins. Use clean footwear, remove swarf and other contaminants regularly. For further information refer to the MRM Code of Practice.

### Touch Up Paint

ColorCote® is a baked on paint system which has different weathering characteristics to standard air drying paints. Do not use touch up paint on ColorCote® products. Minor scratches should be left alone.

### Clean Up

Installation procedures involving self-drilling screws, drills and hacksaws etc. will leave deposits of swarf and metal particles. These particles including blind rivet shanks, nails and screws should be swept and washed from the roof at the end of each day.

### Dissimilar Materials

When dissimilar metals come into contact with each other, the electric potential difference between the metals establishes a corrosion cell and accelerated corrosion can occur. To avoid this problem the following precautions should be observed:

- Avoid discharges of water from brass or copper pipes onto ColorCote® MagnaFlow™.
- Do not use non-galvanised steel, copper, stainless steel or Monel metal in direct contact with ColorCote® MagnaFlow™.
- Do not use lead flashings in contact with ColorCote® MagnaFlow™ products. Soft edge aluminium, or notching of flashings, are the best solutions.
- Do not use tanalised timber in direct contact with ColorCote® MagnaFlow™ products. Use PVC tape or similar barrier to isolate potential problem points of contact between materials.

ColorCote® MagnaFlow™ products are not suitable for use in the following situations:

- Animal shelters, where excessive ammonia fumes can accumulate due to inadequate venting, or where direct contact with animal effluent can occur.
- Water tanks or areas where a constantly wet environment is maintained.
- In direct contact with concrete, or where lime deposits are evident.
- In contact with soil. (Allow 75mm run off below cladding sheets to ground level.)

### Fastenings

Match corrosion resistance of the fastenings with the service life of the chosen ColorCote® MagnaFlow™ product. Class 4 coated screws will give best service life with ColorCote® MagnaFlow™.

Do not use stainless or Monel fasteners on ColorCote® MagnaFlow™ products. Aluminium rivets should be used for best results. For further details refer to the MRM Code of Practice.

### Sealing and Jointing

Where sealed joints are required, use only neutral cure silicon rubber sealant, together with mechanical fasteners, such as aluminium rivets. Do not solder or weld ColorCote® products.

### Unwashed Areas

These are typically those areas that are not washed by natural rainfall, such as the underside of eaves, sheltered roofs or wall cladding etc. These areas are excluded from warranty. Pacific Coilcoaters recommends the exclusion of unwashed areas by design wherever possible. In cases where this is not possible, then a regular washing programme should be put in place. Contaminants should be removed by water blasting or mechanical washing with water and a soft nylon brush for best results at least every 6 months, or more frequently if contaminant build-up keeps occurring.

### Roof Pitch

Do not use a pitch less than 3° to avoid ponding and premature degradation of the coating system.

## ColorCote® MagnaFlow™ X (formerly ZMX)

Conforms to AS/NZS 2728:2013 Product type 4 (Table 1.1). Suitable for ISO 9223 Atmosphere Classification C1-C5 as per AS/NZS 2728:2013.

### Substrate

Hot dipped Aluminium / Zinc / Magnesium alloy coated steel coil with a minimum coating weight of 240 gms/m<sup>2</sup> (240 gms per m<sup>2</sup>). Manufactured to AS 1397 : 2011. Steel grade either G550 or G300.

### Pretreatment

Corrosion resistant chromate conversion coating.

### Primer

High build flexible corrosion chromated primer both sides. Nominal film thickness 16µm ± 1µm on the topside and 10µm ± 2µm on the reverse.

### Finish Coat

70% PVF<sub>2</sub>. The exterior coat of ColorCote® MagnaFlow™ X is a PVF<sub>2</sub> (polyvinyl/difluoride) paint system containing at least 7% PVF<sub>2</sub> Resin in the dry paint film. Nominal film thickness 20µm ± 2µm.

**Note:** the finish coat can be applied to one or both sides of the sheet in the same or different colours. Colours outside the standard range may be available depending on colour and quantities.

### Backing Coat

Shadow Grey (standard colour) wash coat 5 microns thickness ±1µm.

### Gloss

Typical gloss levels are 25%, measured in accordance with ASTM D523-89 (60°). Non standard gloss levels may be available on application.

### Strippable Film

Products can be supplied with an optional strippable protective film at extra cost. This material has a relatively short life span under exterior exposure conditions. It should be removed either just before or just after product installation. If stored indoors strippable film should be removed within 12 months of delivery from Pacific Coilcoaters. Light colours must use strippable film to prevent marking during rollforming.

### Expected Performance

Outdoor Durability: ColorCote® MagnaFlow™ X, under normal well washed conditions of exposure, is expected to show no cracking (other than that which may occur during forming), flaking or peeling of paint film for 15 years from date of installation.

Colour change during service will depend on the colour chosen, aspect, design of the structure and the environment. Maximum colour change levels of ColorCote® MagnaFlow™ X colours in moderate environments after 15 and 20 years of service are given in warranty documentation. Colour change is measured using an instrumental colour spectrophotometer, according to ASTM D-2244-93, and determined on clean surfaces, free of all dirt, chalk, oxidised film, oil, grease and other foreign contaminants.

Some chalking may occur. A maximum rating of 2 is expected after 20 years exposure, when measured in accordance with AS/NZS 1580.481.1.11:1998. Scale is between 0 and 5 with a lower number indicating less chalking.

## Handling and Storage

To avoid damaging the paint surface the material must be handled carefully during transport and rollforming. Pacific Coilcoaters does not recommend the use of rollforming lubricants on ColorCote® products, as they will affect performance of prepainted steel and will lead to staining and uneven premature fading.

## Typical Properties

- Mar Resistance: Good
- Scratch Resistance: Good
- Impact Resistance: (AS/NZS 2728 table 2.2 and Appendix E) – Greater than 10 Joules
- Pencil Hardness: (AS/NZS 1580.405.1) – F minimum
- Bend Test: (AS/NZS 2728 section 2.6 and Appendix F) – No loss of paint adhesion when bent around a diameter equal to five times the thickness of the sheet.
- Heat Resistance: Suitable for continuous service up to 100°C. Continuous service at higher temperatures may cause some colour change of the paint film.

Index	Rating	Range
Ignitability Index	0	0-20
Spread of Flame Index	0	0-10
Heat Evolved Index	0	0-10
Smoke Developed Index	0-2	0-10

## Accelerated Corrosion Tests

(Tests are conducted on a flat panel).

### Salt Spray

Meets the requirements of AS/NZS 2728:2007 Sections 2.8 and 2.10

### Humidity Resistance

Meets the requirements of AS/NZS 2728:2007 Sections 2.8 and table 2.9

### QUV Resistance

Meets the requirements of AS/NZS 2728:2007 Sections 2.8 and table 2.4

## Chemical Resistance

Good resistance to accidental spillage of solvents such as methylated spirits, mineral turpentine, toluene, Trichloroethylene and dilute acids and alkalis. All spillages should be removed immediately by wiping or washing.

## Recommended End Uses

Exterior uses where high formability, such as crimp curving after rollforming, excellent colour and gloss retention is required. It is suited to environments such as severe marine, and industrial sites where there is a high risk of corrosion due to corrosive elements in the atmosphere.

For information concerning product use in areas not covered by ColorCote® MagnaFlow™ X refer to the ColorCote® AlumiGard™ X technical brochure or contact Pacific Coilcoaters for details.

## Site Practice

If nestable profiles become wet while closely stacked, formation of wet storage stain or 'white rust' is inevitable.

To minimise the possibility of inadvertent contamination:

- Inspect deliveries on arrival. If moisture is present, individual sheets should be dried immediately with a clean rag and then stacked to allow air to circulate and complete the drying process.
- Well ventilated storage is essential. Always store metal products under cover in clean, well-ventilated buildings.
- Cross-stack or fillet sheets where outside storage is unavoidable and make provision for a fall to allow water to run off.

It is the responsibility of the roofing contractor to avoid damaging the roof sheeting during its installation and fixing. Never drag sheets from a pile. Remove by 'turning' off the stack. Lift sheets onto a roof, and do not drag over the eaves or purlins. Use clean footwear, remove swarf and other contaminants regularly. For further information refer to the MRM Code of Practice.

### Touch Up Paint

ColorCote® is a baked on paint system which has different weathering characteristics to standard air drying paints. Do not use touch up paint on ColorCote® products. Minor scratches should be left alone.

### Clean Up

Installation procedures involving self-drilling screws, drills and hacksaws etc. will leave deposits of swarf and metal particles. These particles including blind rivet shanks, nails and screws should be swept and washed from the roof at the end of each day.

### Dissimilar Materials

When dissimilar metals come into contact with each other, the electric potential difference between the metals establishes a corrosion cell and accelerated corrosion can occur. To avoid this problem the following precautions should be observed:

- Avoid discharges of water from brass or copper pipes onto ColorCote® MagnaFlow™ X.
- Do not use non-galvanised steel, copper, stainless steel or Monel metal in direct contact with ColorCote® MagnaFlow™ X.
- Do not use lead flashings in contact with ColorCote® MagnaFlow™ X products. Soft edge aluminium, or notching of flashings, are the best solutions.
- Do not use tanalised timber in direct contact with ColorCote® MagnaFlow™ X products. Use PVC tape or similar barrier to isolate potential problem points of contact between materials.

ColorCote® MagnaFlow™ X products are not suitable for use in the following situations:

- Water tanks or areas where a constantly wet environment is maintained.
- In direct contact with concrete, or where lime deposits are evident.
- In contact with soil. (Allow 75mm run off below cladding sheets to ground level.)

### Fastenings

Match corrosion resistance of the fastenings with the service life of the chosen ColorCote® MagnaFlow™ X product. Galvanised nails should not be used on ColorCote® MagnaFlow™ X. Class 4 coated screws are the minimum for ColorCote® MagnaFlow™ for roofing and cladding in severe environments.

Do not use stainless or Monel fasteners on ColorCote® MagnaFlow™ X products. Aluminium rivets should be used for best results. For further details refer to the MRM Code of Practice.

### Sealing and Jointing

Where sealed joints are required, use only neutral cure silicon rubber sealant, together with mechanical fasteners, such as aluminium rivets. Do not solder or weld ColorCote® products.

### Unwashed Areas

These are typically those areas that are not washed by natural rainfall, such as the underside of unsarked overhanging roofing and recessed doorways in commercial cladding, tops of garage doors etc. These areas are excluded from warranty. Pacific Coilcoaters recommends the exclusion of unwashed areas by design wherever possible. In cases where this is not possible, then a regular washing programme should be put in place. Contaminants should be removed by water blasting or mechanical washing with water and a soft nylon brush for best results at least every 6 months, or more frequently if contaminant build-up keeps occurring.

### Roof Pitch

Do not use a pitch less than 3° to avoid ponding and premature degradation of the coating system.

# ZINC

## General Characteristics

Zinc is composed of very high quality zinc Z1 (99,995% zinc), as defined by the EN 1179 standard, to which titanium and copper are added:

- Copper raises the mechanical resistance of the alloy making it harder and stronger. It also controls the colour of the natural protective patina that is created as the zinc weathers
- Titanium increases the creep resistance, permitting far greater thermal expansion and contraction of the material without causing metal fatigue
- Titanium: 0.06% minimum – 0.2% maximum
- Copper: 0.08% minimum – 1.0% maximum
- Aluminium: 0.015% minimum.

## The Material & Finish's

Zinc is an imported material, and generally is available and not carried as a stock item. In its original natural form it has colour closely resembling that of plain aluminium. Over a period of time the zinc will start to patina, and change colour to a light grey. This type of natural zinc is not commonly used in New Zealand.

Quartz-Zinc: is the mainly used material in New Zealand which is the natural product that has been through a surface treatment process that speeds up the patina effect, that generally would take's years to achieve.

Anthra-Zinc: is the same base material but has under gone a coating process to give a charcoal black finish. The finish may slowly and gradually lighten over time to a dark grey.

Pigmento: is available in four colours, organic red, green, blue and brown. The colour is created by adding mineral pigments to the durably protective coating.

Zinc in compliance with BS EN 988: 1987 Zinc and Zinc alloys. Specification for roll flat products for buildings.

## Material Thickness

Available in 0.70mm.

## Material Width

Natural Zinc and Quartz-Zinc	600mm
Anthra-Zinc and Pigmento	600mm

## Durability

The patina forms a layer which is compact, adherent, insoluble in rainwater, and which will hinder any further exchanges between oxygen and zinc, thereby controlling the corrosion rate and maintaining it at a low level. Nevertheless, the durability of zinc can be reduced by some acid pollutants, which increase the corrosion rate. The main pollutant is sulphur dioxide (SO<sub>2</sub>). Sulphur dioxide reacts with the patina to form a sulphate (ZnSO<sub>3</sub> + ZnSO<sub>4</sub>), which is soluble in water and is washed away by rain.

Ongoing protection against corrosion requires oxygen to be available at the surface. Zinc can also suffer from corrosion when used in ways that prevent this, e.g. under ventilated skillion roof construction, continuously wet environments like end laps or under accumulated debris.

## Maintenance

Regular washing with water and a soft brush is required every 4 – 6 months to maintain an unaffected surface for good aesthetic quality in industrial and marine environments. Particular attention is required in server marine locations and sheltered areas to prevent the build-up of salt or dirt deposits.

## Recyclability

Fully 100%.

## COPPER

### General Characteristics

The copper mainly used in the roofing industry is DHP 122 ½ hard it is 99.9% pure and is widely used on architectural builds. When new the copper is bright reddish orange and over time will develop a patina on the surface. This patina will vary in colour depending on the atmosphere the material is in. Some of the patina colours are green, blue/green and nut brown.

Compliance to AS1566:1997 COPPER AND COPPER ALLOYS - Re-rolled flat products and alloys.

### Material Thickness

General material thickness used in New Zealand is 0.55 to 0.70mm.

### Material Width

The most common sheet size is 2400 x 1000 used for flashings and rainwater goods. For roll-formed goods like Eurotray® a 600mm wide coil is used.

### Durability

Copper offers excellent resistance to corrosion in a wide variety of environments. It is resistant to non-oxidizing acids and salts, seawater and fresh water, hot or cold atmospheric corrosion and a wide variety of organic materials. Copper is not resistant to oxidising acids, oxidising heavy metal salts, ammonia, and cyanides, complex ions and high velocity aerated waters.

### Maintenance

Just an occasional wash down with fresh water and that's it.

### Recyclability

Fully 100%.



## BITUMEN COATED BUILDING PAPER

Black bitumen saturated building paper is a breather type kraft building paper intended for use within the roofs and wall cladding of a building where the following are required:

- Moisture permeability
- Reduced air flow
- Absorbency
- Non fire retardant

### Features and Benefits

Black building paper reduces wind entry into the cavity, thereby assisting the performance of insulating materials and provides a temporary protection against wind, dust, rain, and other weathering elements until the external cladding is applied. Black building paper is not designed for use in extreme weathering conditions. Black building paper is permeable to water vapour thereby allowing any excess water vapour, which might otherwise condense in the structure, to escape. Black building paper is not considered to be hazardous under the New Zealand Health Safety and Employment Act 1992.

### Applications

Dimond Black Building Paper is available in three grades for different applications –

Grade	Application
Bitumac 720	As an extra light duty wall wrap, fixed onto framing at 450mm centres. Framing at centres greater than 450mm require 720 to be installed with polypropylene tape at 300mm centres horizontally over the framing once the wrap has been installed. Recommended in medium wind zones.
Thermakraft 213	As a heavy weight building paper used as a wall wrap or roofing underlay supported on netting. Recommended in very high wind areas.
Bitumac 750	As a heavy duty roofing underlay, self supported up to a purlin spacing of 1200mm, otherwise supported on mesh or strapping at 300mm centres. Recommended in very high wind areas.

Duty grade of underlay in accordance with NZS4200.1.

10m maximum run lengths are recommended to minimise shrinkage.

## SYNTHETIC FIRE RETARDANT UNDERLAYS

Synthetic Fire Retardant self supporting underlays are designed for use under roofing and cladding.

The synthetic product consists of a micro –porous water resistant film laminated between two layers of non woven spun bonded polyolefin where the following is required:

- Fire retardant
- Moisture permeability
- Air barrier
- Water barrier

### Features and Benefits

The fire retardant properties of these underlays do not support combustion from Fire both during and after construction. Being synthetic they may be exposed to rainfall during installation without affecting future durability or performance.

Being Vapour permeable the underlay allows moisture to pass through minimising the build up of condensation within the roof space and allows it to escape to the outside.

Self supporting on spans up to 1200mm, its tough to tear, so offers best resistance when exposed in all wind zones including up to extra high. Can be left exposed to weather for 7 days.

Shrinkage is minimal so there is no restriction on maximum run length.

It's not considered to be hazardous under the New Zealand Health Safety and Employment Act 1992.

### Applications

Product	Application
Sisalation Surewrap Roof And Thermakraft Covertex 407 and 405	<p>All Roof applications down to 3 degrees roof pitch, on purlin spacing's up to 1200mm.</p> <p>Otherwise support on netting or strapping at 300mm centres.</p> <p>Can be laid vertically or horizontally on roof pitches equal to and above 8 degrees without support provided the purlins spacing's are less than or equal to 1200 mm centres.</p> <p>Can be laid horizontally without support on Roof pitches less than 8 degrees, but provided purlins must be at 1200 centres or less and edges are fully restrained by the roof fixings. Otherwise it must be supported.</p> <p>Vertical lay on roof pitches less than 8 degrees must be supported.</p> <p>Can be used as direct fixed in contact with the roof.</p>
Sisalation Surewrap wall And Thermakraft Covertex 403	<p>Suitable for all wall applications on timber or steel framing, either direct fixed to framing or used over a vented cavity system.</p> <p>Can be in direct contact with metal cladding.</p> <p>Suitable as an air barrier to walls that are not lined.</p>

Meets the NZBC requirements	<p>B2.3.1 Durability (a) 50 years (b) 15 years</p> <p>C3 Fire affecting area beyond the fire source C3.4(C)</p> <p>E2/AS1 for use as a roof underlay</p> <p>F2.3.1 No health hazard present to people</p>
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## GALVANISED WIRE MESH

Galvanised Wire Mesh or Netting is used to support roofing underlay. Mesh is recommended in an appropriate grade to qualify for use as Safety Mesh.

2.2.2.3.1

### MESH

Refer Section 2.4.5 Safety for information on Aus mesh.

2.2.2.3.2

## BAYONET GALVANISED WIRE NETTING

### Description

Bayonet Galvanised Wire Netting consists of a range of hexagonal netting made from imported standard galvanised mild steel wire which conforms to NZS/AS 1650:1989. The wire tensile strength is between 380 and 550 MPa and its galvanising weight is between 24 and 31 g/m<sup>2</sup>.

The product range consists of two sizes of wire netting for use as building paper support.

Mesh Size (mm)	Wire Diameter (mm)	Roll Width (mm)	Roll Length (m)	Roll Area (m <sup>2</sup> )
75	1.0	2000	50	100
50	1.0	2000	50	100
		900	50	45

### Handling and Storage

Bayonet Galvanised Wire Netting must be handled with care to prevent damage to the netting.

The rolls must be stored on end, under cover and protected from moisture. They must not be double stacked or used to support other materials. Bayonet Galvanised Wire Netting rolls should not be stored on concrete floors for long periods, particularly where moisture is present, as this can result in an accelerated corrosion of the galvanising.

### Mesh Size Selection

Bayonet Galvanised 50mm and 75mm Wire Netting is suitable for supporting building paper or roofing underlay when the wire netting is supported by timber or steel roof or wall framing. 50mm mesh size must be used where the Wind Zone is very high, or where heavy weight underlay is to be used, e.g. in all non residential roofing systems.

The 50mm mesh size must be used for buildings not covered by NZS 3604, and is recommended when:

- The paper is to be exposed for more than two days and up to one week
- There is a high risk that ongoing construction work may cause damage
- The building is in a high rainfall region (>1400mm/year)

Netting used on spans greater than 2m, or in windspeeds greater than 50 m/s, is outside the limitations published in BRANZ Appraisal No 318A (1997).

### Serviceable Life

Bayonet Galvanised Wire Netting, when used to support building paper or roof underlay in roof spaces or wall cavities, will have a serviceable life in excess of 50 years when:

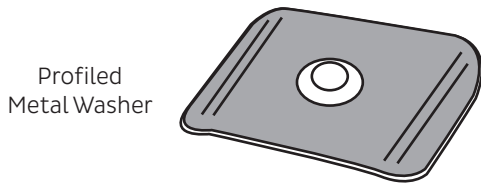
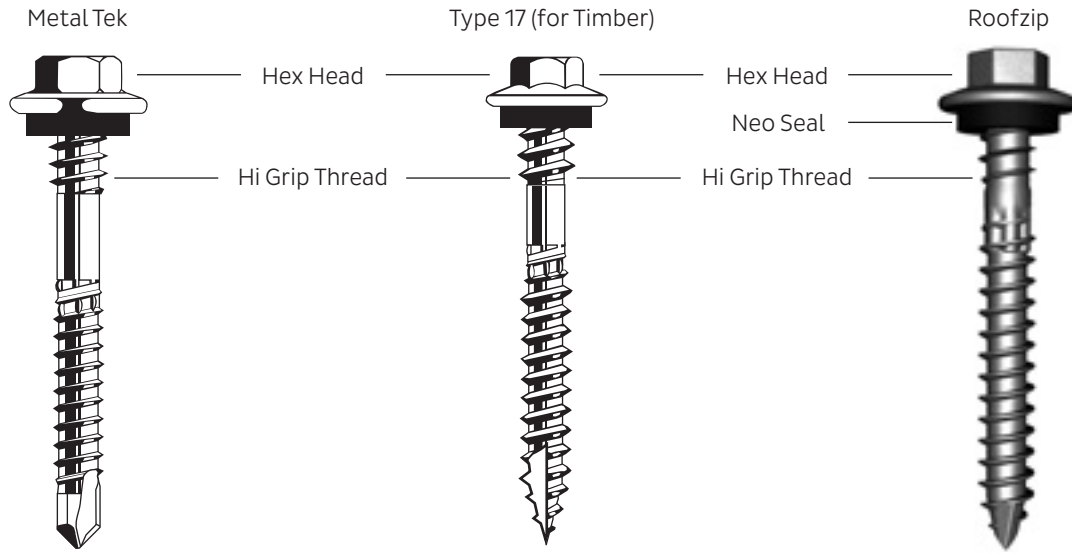
- Enclosed with the roof space or wall cavity
- Subject to a dry interior environment with relative humidity not greater than 90%
- Not exposed to a corrosive environment
- Not exposed to the atmosphere for more than one week before cladding is installed
- Air extraction or dehumidifying devices are not vented into the roof space or wall cavity

### Installation

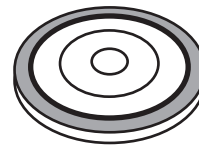
Refer Section 2.3.

# BUILDEX® SCREW FASTENERS

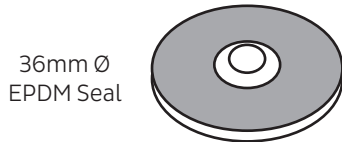
## FASTENER ASSEMBLY AND DESIGNATION



Profiled Metal Washer



32mm Ø Maxi-weatherlok Washer



36mm Ø EPDM Seal

### Designation

Designation example 14 – 10 x 20 HG means 14 gauge, 10 threads per inch and 20 mm in length measured from the underside of the head to the point of the screw. Screws to have Higrup thread.

**Note:** Screws can be specified with or without the Higrup thread option.

## BUILDEX® METAL TEKS® FIXING ROOFING AND WALL CLADDING TO METAL

TEKS® self-drilling screws have a hardened drill point that will drill and thread in structural steel and mild steel. To choose the correct fastener it is necessary to select one where the length of the drill point is equal to or greater than the total thickness of the material to be drilled, and the table below gives the thickness limitations for each screw. The length should allow three threads to protrude beyond the metal being fastened to.

Taptites® require pre-drilled holes into which the fastener will thread.

### Selection Guide

Use	Dimensions	Coating / Material Available			Hi Grip Available
		Climaseal 4®	304 Stainless Steel	Thickness Limitation (mm)	
Hex Head fixing to steel purlins and girts	12-14x20	Yes	-	4.5	-
	12-14x35	Yes	-	4.5	Yes
	12-14x45	Yes	-	4.5	Yes
	12-14x55	Yes	-	4.5	Yes
	12-14x68	Yes	-	4.5	Yes
	12-14x75	Yes	-	4.5	-
	14-20x22	Yes	-	6.4	-
	14-10x25	Yes	-	3.0	-
	14-10x42	Yes	-	3.0	-
	14-20x45	Yes	-	6.4	-
	14-10x50	Yes	-	3.0	-
	14-10x65	Yes	-	3.0	-
	14-10x75	Yes	-	3.0	-
	14-10x95	Yes	-	3.0	-
Wafer Head fixing decking clips to steel purlins	10-16x16	Class 3 only	-	3.5	-
	10-16x25	Class 3 only	-	3.5	-
Hex Head stitching sheet metal	10-16x16	Yes	-	0.8	-
	10-16x25	Yes	-	0.8	-
	12-11x20	-	Yes	0.8	-
Hex Head Taptites Pre-drilled holes into heavy gauge steel	14-24x25	-	Yes	-	-
	14-24x50	-	Yes	-	-
	14-24x65	-	Yes	-	-
	14-24x75	-	Yes	-	-
Phillips head Ripple hitek for Baby Corrugate	10-16x20	Class 3 only	-	3.0	-

## BUILDEX® TYPE 17 FIXING ROOFING AND WALL CLADDING TO TIMBER, OR STITCHING SHEETMETAL

Type 17's are self-drilling screws for fixing into timber and thin metal thicknesses up to 0.6mm. To use the correct fastener, the screw length should be chosen to achieve the minimum amount of embedment given in the table below.

### Selection Guide

Use	Dimensions	Coating / Material Available			Hi Grip Available
		Climaseal 4®	304 Stainless Steel	Embedment Depth (mm)	
Hex Head fixing to timber purlins or girts	12-11x25	Yes	-	23	-
	12-11x65	Yes	-	30	Yes
	14-10x25	Yes	Yes	23	-
	14-10x50	Yes	Yes	35	-
	14-10x65	Yes	Yes	35	-
	14-10x75	Yes	Yes	35	-
	14-10x90	Yes	Yes	35	-
	14-10x100	Yes	-	35	-
Hex Head stitching sheet metal max 0.6mm thickness	10-12x20	Class 3 only	-	-	-
	10-12x30	Class 3 only	-	-	-
	10-12x30	Class 3 only	-	-	-
Phillips head Ripple hitek for Baby Corrugate	10-16x30	Class 3 only	-	30	-

## BUILDEX ROOFZIPS®

Roofzips® are a revolutionary self drilling roof fastener that can be used into all types of timber, and steel purlins up to 1.5mm thick. Its improved drill tip starts quicker into the metal, overcomes skidding and scratching of the screw, as well as reduces washer damage. Incorporates HiGrip, to stop the roof moving down the screw shank, and Shankguard to protect the fastener shank from scratching during fixing. Only available in the superior Climaseal 4® coating for use in moist areas up to Severe Marine.

		Climaseal 4®	Embedment Depth (mm)	Hi Grip Available
Hex head Fixing to timber purlins or girts or steel purlins up to 1.5mm thick	M6 x 50mm HG - Z4	Yes	30	Yes
	M6 x 65mm HG - Z4	Yes	30	Yes

## MATERIAL GRADES

Buildex® fasteners are available in a finish that complies with AS3566, and are made to a high standard of quality backed by strict inspection and testing procedures endorsed to ISO 9002.

### Climaseal 4®

Climaseal 4® fasteners meet and exceed the AS3566 Class 4 specifications. Climaseal 4® is a unique coating system comprising of an alloy combination which gives exceptional galvanic protection. The coating thickness exceeds 50µm, which is twice the thickness of a lesser Class 3 product.

1. A mechanically deposited zinc alloy coating giving excellent galvanic protection.
2. A chromate conversion coating to passivate the zinc alloy, further inhibiting coating loss.
3. An aluminium filled polyester coating with good all-round corrosion and long-term weathering resistance.

Climaseal 4® should be used in all areas including coastal areas where salt, wind, UV and moisture are prevalent, in tropical zones, in industrial zones subject to acid rain fall-out, where agricultural spraying is carried out, or anywhere high performance cladding material is specified.

Effective sealing of roofing sheets/cladding and reduced corrosion with an improved black non-conductive EPDM seal. The black seal remains elastic in temperature extremes, and will not breakdown and allow water entry.

It is particularly recommended for use in moderate and severe marine environments.

## CATEGORY 5 SCREWS

Extra coating applied to the screw offering superior corrosion performance with increased durability allowing for use in a category class 5 severe marine in accordance with ISO9223: 2012.

Available only on a few of the screw range and sizes.

## Buildex® Stainless Steel

Buildex® has a comprehensive range of stainless steel fasteners available in the following grades:

### Grade 304

This is the basic composition of Austenitic Stainless Steel. Overall corrosion resistance is rated Excellent. Has the ability to withstand ordinary rusting, resists nitric acid well, sulphur acids moderately and halogen acids poorly. The Buildex® range consists of:

- **Type 17's**  
Developed to self-drill through long-life corrosion resistant panels into timber where a highly corrosive environment exists. The drilling point is designed to drill its own hole through various aluminium and steel roofing and cladding sheets and secure into timber in one simple operation. Available in a Hexagon Head or a Countersunk Head where a flush finish is required.
- **Taptites**  
Thread rolled fasteners for fixing long-life roofing and cladding sheets to steel or aluminium. Ideal for jobs where thickness of material prevents the use of self-drilling fasteners. Taptites produce their own mating threads to ensure greater contact and a tighter fit.
- **Stitch Screw**  
Ideal for joining light gauge metal such as gable trim and parapet flashing.

### Grade 316

An Austenitic Stainless Steel, commonly known as marine grade, is required where submergence in salt water, or direct contact in severe environments will occur.

Buildex® Type 17's and Taptites are available in Grade 316 – but only made to order (minimum quantities may apply).

### Alutite Aluminium Type 17 Hex Head Screws

Designed for fixing aluminium roofing and cladding into timber in severe marine environments. Supplied with neo seals only or a 14mm diameter aluminium and a EPDM bonded washer, which is compatible with aluminium roofing and cladding. Material: AA 2024 Aluminium (SS 4338).



## HIGRIP

HiGrip from Buildex® is a revolutionary design in roof fasteners that overcomes the traditional problems with crest fixing metal roofing to steel or timber.

When roofing screws are placed on the top of the roofing profile prior to installation, an indent area sometimes forms around the screw due to the operator forcing down heavily before drilling commencement. When the profile is fixed down with a non-HiGrip fastener this indentation remains around the fastener, causing water entry.

HiGrip is a secondary thread located at the top of the shank under the washer face. During installation the thread of the HiGrip is carrying the roof profile in an upward motion while the washer face is carrying the fastener in the downward motion. The upward pressure at the HiGrip tends to straighten or reverse the indent made by the initial penetration, therefore preventing the possibility of water entry.

## STRENGTH PROPERTIES

### Ultimate Average Pullout Loads

Buildex® TEKS® Screws & Roofzips Fixing to Grade G450						
Gauge/TPI	1.0mm	1.2mm	1.6mm	1.9mm	2.4mm	3.2mm
10-16	2819N	3519N	4563N	-	7823N	-
12-14	2826N	3174N	4428N	5525N	7620N	11140N
12-24	-	-	3945N	-	7375N	10420N
14-10	3010N	3441N	4594N	6260N	8650N	-
Buildex® Roofzips						
M6-11 TP 1		3200N	4800N			

Buildex® Type 17 Screws & Roofzips Fixing to F5 (F5/JD4 Timber - Radiata Pine)					
Embedment Depth					
Screw Type	20mm	25mm	30mm	35mm	50mm
12g	-	-	12-11x45mm Hex 5400N	12-11x50mm Hex 6300N	-
14g	-	-	14-10x50mm Hex 6500N	14-10x50mm Hex 6900N	14-10x75mm Hex 9700N
M6 Roofzip			5400N	6300N	

Fixing to F17 J3 (Timber - Seasoned Hardwood)					
Embedment Depth					
Screw Type	20mm	25mm	30mm	35mm	50mm
12g	-	-	12-11x45mm Hex 6400N	12-11x50mm Hex 7900N	-
14g	-	-	14-10x50mm Hex 7100N	14-10x50mm Hex 9100N	14-10x75mm Hex 13500N
M6 Roofzip			6300N	7200N	

Mechanical Properties			
Screw Type	Single Shear Strength	Axial Shear Strength	Torsional Strength
Buildex® TEKS® Screws			
10g	6.8kN	11.9kN	8.4Nm
12g	8.8kN	15.3kN	13.2Nm
14g	10.9kN	19.7kN	18.5Nm
Buildex® Type 17 Screws			
12g	8.4kN	13.9kN	13.4Nm
14g	10.2kN	17.9kN	18.5Nm
14g Stainless Steel	10.2kN	12.6kN	12.7Nm
Buildex® Roofzips			
M6	8.5kN	15.4kN	14.0Nm

**Note:** All values are ultimate averages obtained under laboratory conditions (N.A.T.A approved). Appropriate safety factors should be applied for design purposes. These figures apply to Buildex® (BX Head marked) products only.

## WASHERS

**Profiled washers** match the rib shape and fit over the ribs of the roofing profile. They are used for two purposes.

1. To provide an acceptable area of seal around the oversize holes drilled in the sheet material to allow for thermal expansion of the sheet (refer Section 2.1.3.4).
2. To provide load-spreading capability at the fastener point when sheet material is used under high load or long span conditions that cause the load per fastener point to exceed guidelines given in Section 2.1.4.

To fulfil either or both of these functions the recommended washer components are:

- Dimond profiled metal washer – pressed from 0.95mm ZINCALUME™ or 1.2mm aluminium and painted for colour match and corrosion resistance if required. Each sheet profile has a specific profiled washer.
- EPDM (ethylene propylene diene monomer) seal washer – round seal used to fit all sheet profiles. Available in 19mm, 25mm and 36mm diameters for use under profiled washers. Manufactured from EPDM type rubber. It is important for the long term durability of the ZINCALUME™ substrate that the carbon black fillers in the sealing washers and neo seals contain less than 15% by volume or 25% by weight of carbon. All washers and neo seals supplied by Dimond meet this requirement.

Use of other washer components may be satisfactory, but their suitability for use must be checked against the two criteria above.

### Round Washers

Dekfast round embossed washers (with the seal incorporated with the washer) are primarily used on wall cladding to provide:

1. An acceptable area of seal around the fixing screw to allow for thermal expansion of the sheet where fixed in the cladding pin.
2. Load spreading capability at the fastener point of the cladding material when fixed in the pan under high load.
3. Available in 19mm and 25mm diameter.

## DECKING CLIPS – DOUBLE

Used to secure decking profiles such as Dimondek® 300 and Dimondek® 400 by pushing the profile down onto it until it clicks into place. The clip is fixed onto the roof structure with either 2 wafer head screws or 2 nails. Refer Section 2.1.4.7 (b).

The double clip is designed to fix over the previously laid male under rib and centre rib of the sheet to be laid.

### Clip Material

Usually manufactured from either

1. As standard unpainted 1.15mm thick coil with galvanised coating to 275 g/m<sup>2</sup>.
- or
2. Coated for increased durability. Nylon coated over galvanised. Colour may vary between Bright blue or light grey depending on supply. During a salt fog test after 2000 hours this coat showed no sign of degradation. Must be used with Aluminum roofing.
- or
3. Other material, such as brass clips to suit a copper roof, can be manufactured to customer order. The brass is 1.2mm thick and is 1/2 hard brass.



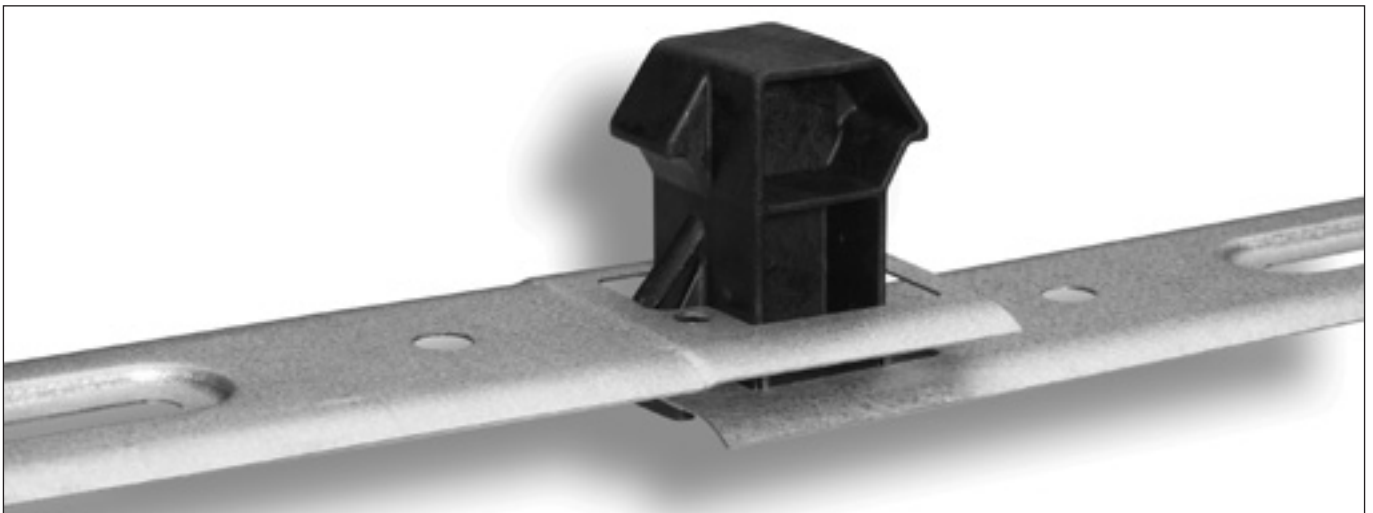
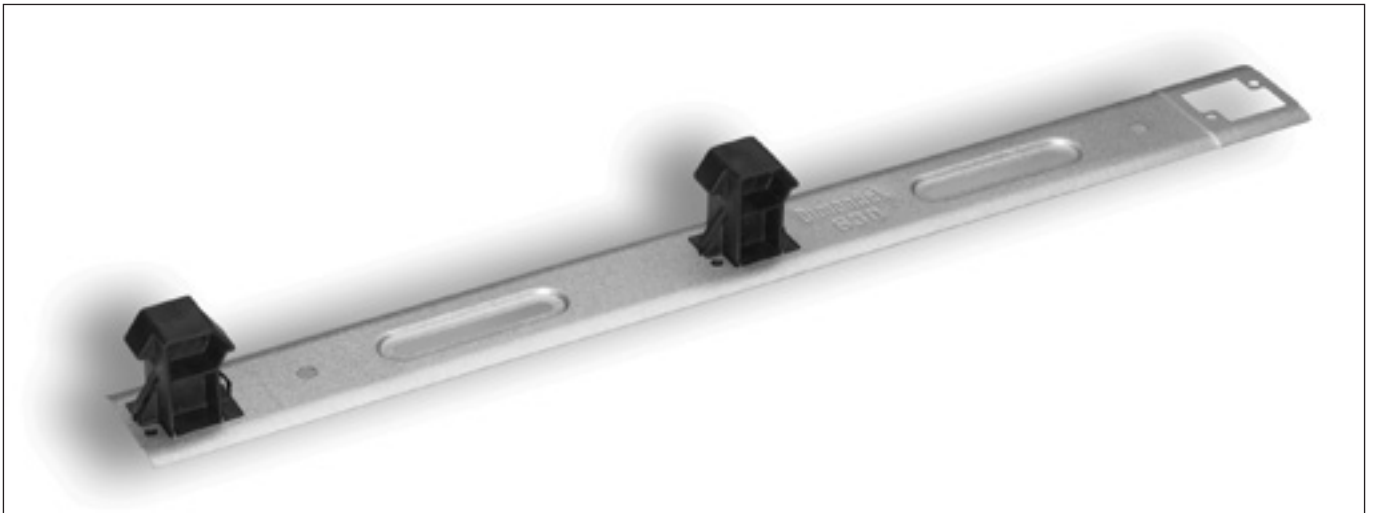
## CONTINUOUS CLIPS

The innovative continuous metal strip with plastic clip is 1 sheet wide and holds 3 ribs of Dimondek® 630 down. It is interlocked with the previously laid clip, thereby controlling the sheet creep and avoiding an increase in profile cover width.

The Dimondek® 630 perimeter clip must always be used over the last rib and clip on the last laid sheet, or on any part of the roof where wind loads exceed 1.6 kPa.

Used only with the Dimondek® 630 profile, the clip is screw fixed onto the roof structure after laying and interlocking with the previous clip. This also allows the building paper to be secured, prior to the laying of the roof. The roof profile is then fully pushed down and locked on to the clip and previously laid sheet.

Available as standard: unpainted AZ150g/m<sup>2</sup> ZINCALUME™ coated steel base with black glass reinforced nylon plastic clip.



NZ Patent Appln No. 539212/539694

## TEE BOLT ASSEMBLY

Used for fixing Dimondek® 300 and Dimondek® 400 to the underside of the structural roof members. Typically Universal Beams.

### Components

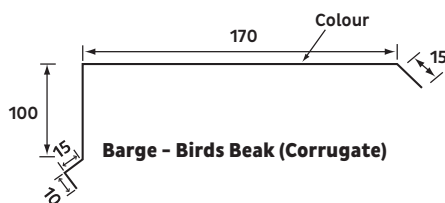
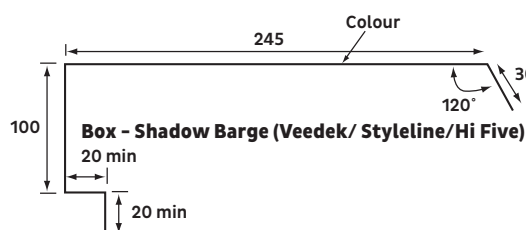
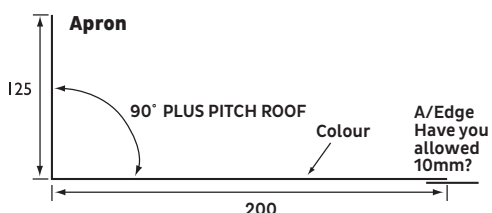
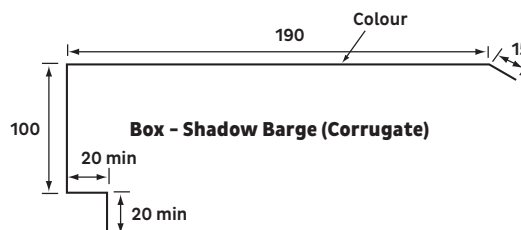
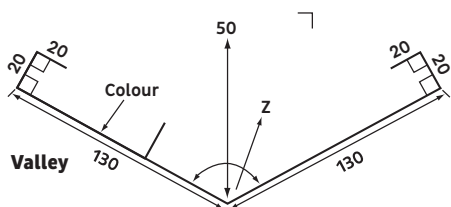
1. A stainless steel Tee bolt; produced from 5mm diameter stainless steel rod welded to form a Tee shape. The longer vertical leg is threaded for approximately 30mm.
2. A stainless steel 3mm thick strap x 25mm wide with 6mm diameter hole, used to secure bolt to the roof structure.
3. One 5mm diameter stainless steel locking nut and washer.
4. Two neo seals to fit over Tee bolt used to seal between the roofing and strap.

## METAL FLASHINGS

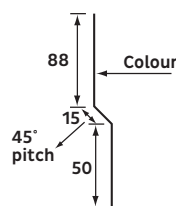
The following range of flashings have proven to be universally popular and suitable for most applications. Minor local variations may exist from that shown. Dimensions are nominal and may vary with changes in material.

For guidance on detailing specific flashings, please refer to General Systems Design – Flashings, Section 2.1.3.6 and Table 2.1.0.

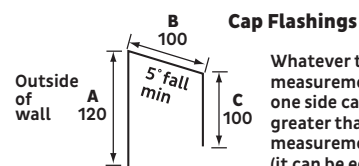
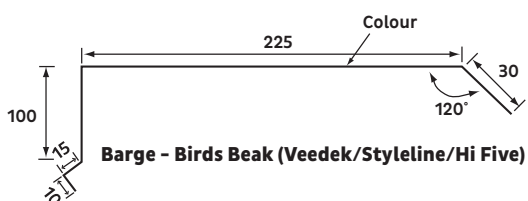
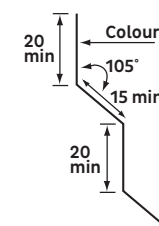
For guidance on Installation, refer Section 2.3.3.



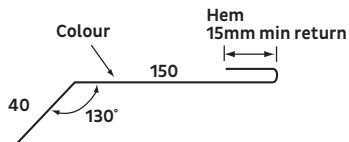
**Z Flashing**



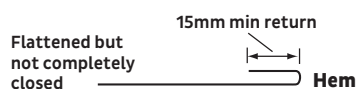
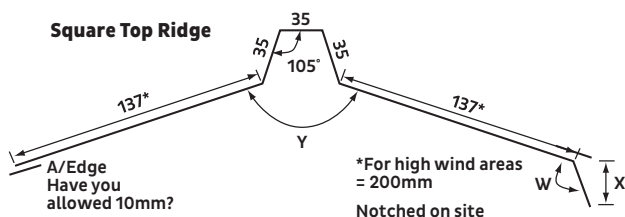
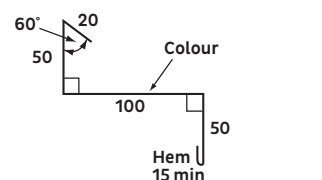
**Window Flashing**



**Gutter Eave Flashing**



**Example of Hem & Angles Required**



## PROFILED FOAM STRIP – ECOFOAM

### Product Description

Ecofoam is a polyethylene closed cell foam produced by Tetral® Industries Ltd (Christchurch) for use in providing long life seals against water, draughts and pests, and is commonly used between the underside of flashings and roof or wall sheet profiles.

### Features

- High tensile and tear strength.
- Resistant to most chemicals and biologically and physically inert.
- Resists embrittlement due to UV exposure.
- Profiled to fit under all the Dimond roofing profiles.
- 20mm wide with dovetailed interlocking ends.

### Compatibility

Ecofoam is suitable for use with any metal roofing or cladding materials and with translucent sheeting.

The carbon black contained in Ecofoam is less than 0.065% by weight and it is therefore suitable for use with ZINCALUME™, COLOURSTEEL® and ColorCote® products.

Block foam – 30 x 30mm polyethylene closed cell foam. Usually ordered in for specific jobs. Allow a 14 working day lead time, for date of order to supply.



## DEKTITE® FLASHINGS

### Product Description

Dektite® Flashings are a range of EPDM or silicone polymer flashings distributed in NZ by DLM, and manufactured by Dek's Industries Pty Ltd (Australia). The range delivers a wide choice of specifically designed innovative products to prevent the ingress of water and dust at service pipes, flues and ducts that penetrate roofs or walls.

Dektite® EPDM and silicone is compatible with ZINCALUME™, galvanised steel, aluminium, copper, lead, asbestos cement, and even timber. Self seals at the top of the cone.

Dektite® sizes are available to accommodate pipe/flue diameters from 1.0mm to 610mm.

Dektite® has a wide range of configurations and sizes to suit virtually any penetration or flashing requirement.

Dektite® Standard Pipe Flashing, suits flue diameters up to 450mm on Corrugate 20° roof pitch

Dektite® Retrofit Flashing, suits flues up to 250mm diameter for 15° roof pitch

Dektite® Soaker Flashing, suits flues up to 610mm diameter for 25° roof pitch

Dektite® Retrofit Soaker Flashing, suits flues 250 to 410mm diameter

Mini Dektite® Flashing, suits smaller diameter from wiring to hot water overflow pipes

Dektite® Tile Flashing, suits pipe sizes up to 320mm diameter

Dektite® Strip & Bullnose Flashing, 225mm wide flat strip.

### Features

- Quick installation using only mechanical fasteners and sealant.
- Flexible base adapts easily to roofing shape.
- Flexible seal to pipe/flue accommodates vibration and isolates noise.
- Durable polymer material withstands UV exposure and heat.
- EPDM withstands temperatures from -30°C to 115°C constant and up to 150°C intermittently.
- Silicone withstands temperatures from -60°C to 200°C constant and up to 250°C intermittently.

### Maintenance

No maintenance is required. In an environment that contains either chemical fumes or salt water, periodic wash down and soapy water is good practice.

### Warranty

Dek's Industries warrants that all Dektite® flashings will perform in accordance with their published specifications, and will be free from defects in material and workmanship for a maximum period of 20 years, commencing from the date of delivery to the end user.