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NOW AVAILABLE IN
MAGNA-SHIELD PRO SYSTEM
MILLFORM

MAGNA-SHIELD PRO®

ULTIMATE CORROSION PROTECTION

TECHNICAL SPECIFICATION GUIDE

- High corrosion resistance
- Concrete compatible
- Attractive finish
- Powder coat compatible

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"Where Strength Matters"

CONTENTS

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Where strength matters

With the strength of steel, Millform is dedicated to building a better Australia. We provide quality products, ensure efficient delivery standards, and offer proven solutions for commercial, construction, industrial, and government clients.

You can find other Millform items on our website.

www.millform.com.au

WHAT IS MAGNA-SHIELD PRO® (MSP) ZM350?

MAGNA-SHIELD PRO® (MSP) ZM350 is a highly corrosion-resistant coated steel with a special alloy composition. **MAGNA-SHIELD PRO® (MSP) ZM350** is a superior steel coating layer combining zinc, aluminium and magnesium with outstanding results. It offers incredible corrosion resistance, impressive scratch resistance, among other benefits.

MAGNA-SHIELD PRO® (MSP) ZM350 with it's unique coating layer of Zinc, 5% Aluminium and 3% Magnesium provides a breakthrough solution in surface corrosion protection and self healing properties on cut edges, making it possible to be applied even in the most severe environments such as livestock, chemicals and marine areas.

MAGNA-SHIELD PRO® (MSP) ZM350 coated steel has a longer lifespan than comparable zinc coated steel products. It provides improved durability and longevity, with a higher level of corrosion resistance than traditional heavier weighted zinc coated steel products. With numerous benefits and superior performance, **MAGNASHIELD PRO® (MSP) ZM350** can be a suitable cost effective alternative to replace stainless steel and aluminium in many applications.

MAGNA-SHIELD PRO® (MSP) ZM350 has at least three times the lifespan of galvanised steel for comparable applications and coating thicknesses.

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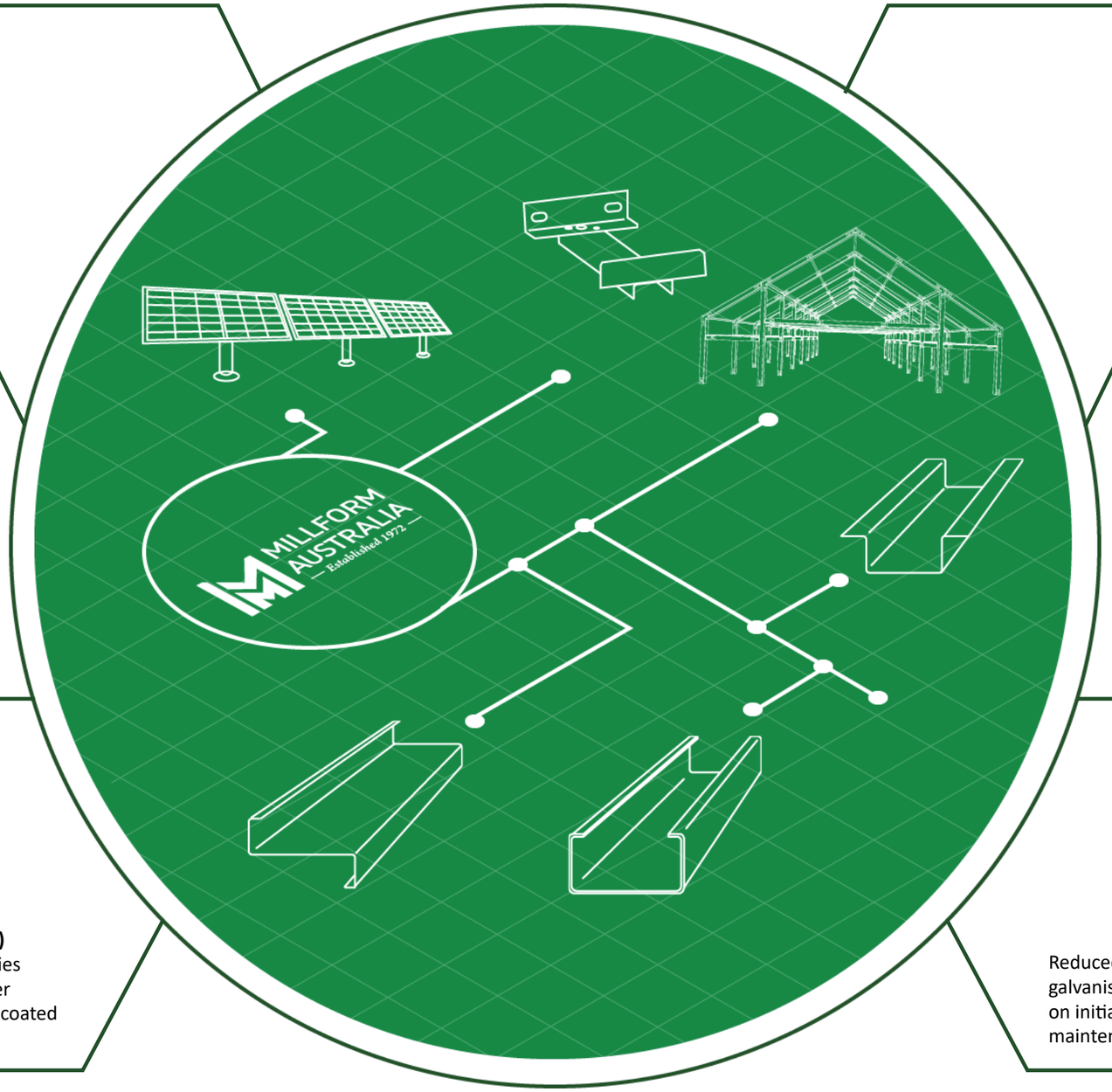
ADVANTAGES OF MAGNA-SHIELD PRO® (MSP) ZM350

Enhanced weldability compared to normal galvanised products or Aluzinc.

Able to be easily powder coated for enhanced aesthetic finish.

In terms of corrosion resistance, **Magna-Shield Pro® (MSP) ZM350** is 3 times more durable than galvanised products (Galvanised Z350) with the same level of coating.



With significant corrosion resistance in harsh environments such as ammonia, chemical, salt water or marine environments, **Magna-Shield Pro® (MSP) ZM350** is perfectly suited for use in C5 environments.

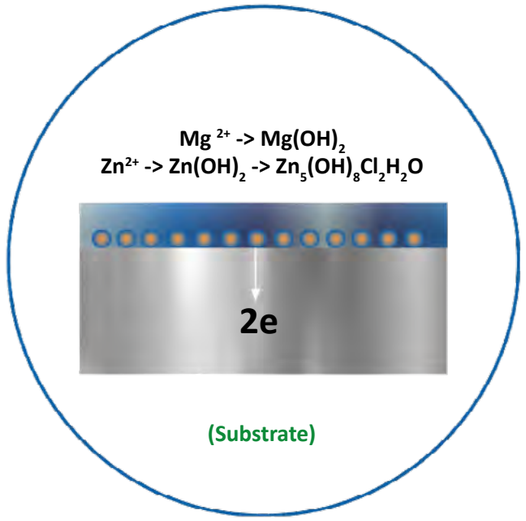
Magna-Shield Pro® (MSP) ZM350 provides extraordinary resistance to abrasion and friction at the surface of steel coil.

Highly resistant to white rust.

Magna-Shield Pro®'s (MSP) ZM350 self healing properties on cut edges provide greater protection than other alloy coated steel products.

Reduced Initial cost versus post galvanised steel. Overall reduction on initial investment, ongoing maintenance and replacement cost.

MAGNA-SHIELD PRO®'S ANTI-CORROSION MECHANISM



The magnesium in the **Magna-Shield Pro®** coating is a catalyst that accelerates the formation of a highly resistant crystalline film / a dense corrosion product which is extremely stable and officially called Simonkolleite [$Zn_5(OH)_8Cl_2.H_2O$](SKT).

When Simonkolleite is formed, it gradually moves outward to seal the entire susbstrate's surface and prevent it from corrosive environmental substances and plays an important role as a corrosion inhibitor for the base metal.

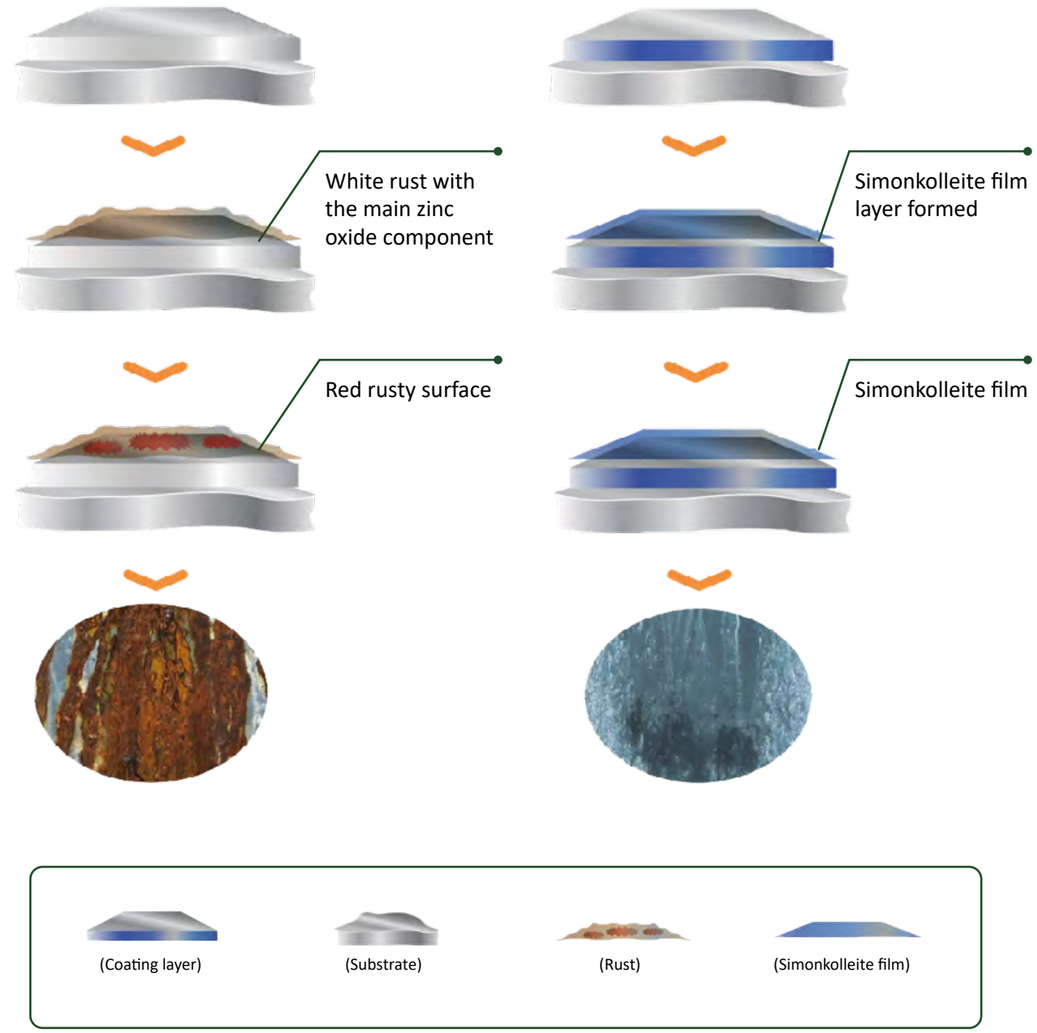
MAGNA-SHIELD PRO®'S ANTI-CORROSION MECHANISM - FLAT SURFACE

GALVANISED Z350

In a galvanised product corrosive substances combine to break into the zinc oxide layer to cause red rust.

MAGNA-SHIELD PRO® (MSP) ZM350

Simonkolleite chemical formula works to prevent the penetration of corrosive substances.



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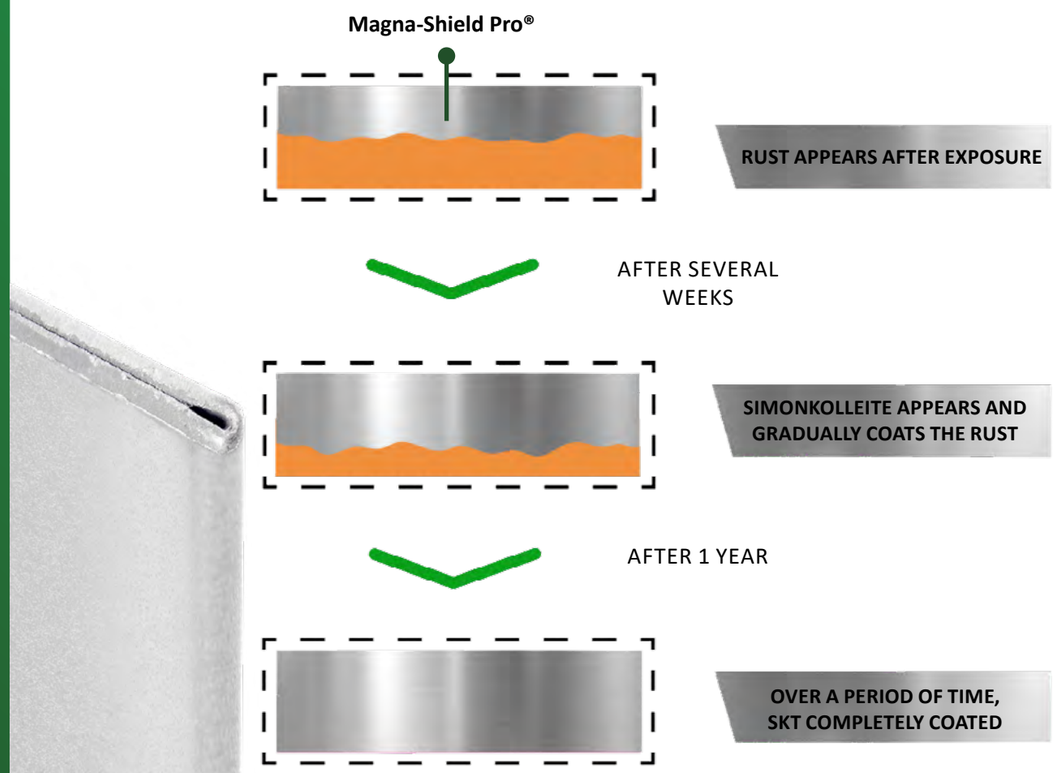
MAGNA-SHIELD PRO®'S ANTI-CORROSION MECHANISM - CUT EDGE

Cut edges are protected due to the osmosis effect.

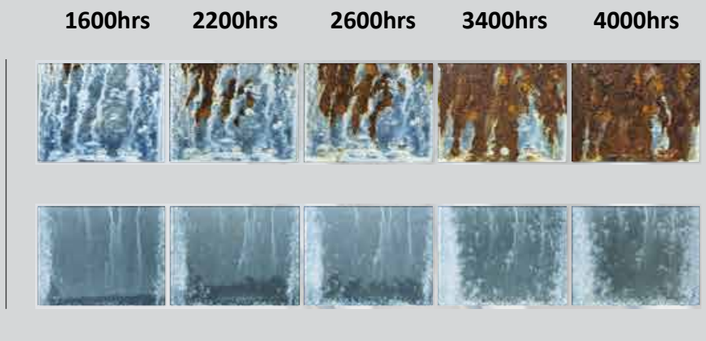


TEST RESULTS - SALT SPRAY ENVIRONMENTS

TEST METHOD:

Salt Spray Test (SST); ISO 9227, JIS Z2371 ASTM B117: 5%NaCl, 35°C.

SALT SPRAY TEST



CONCLUSION:

The corrosion resistance on the flat surface of **Magna-Shield Pro® (MSP) ZM350** is far superior compared to normal Galvanised Z350 or Aluzinc.

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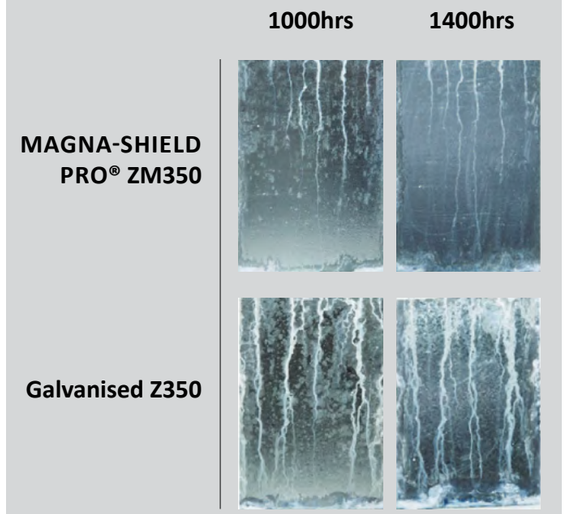
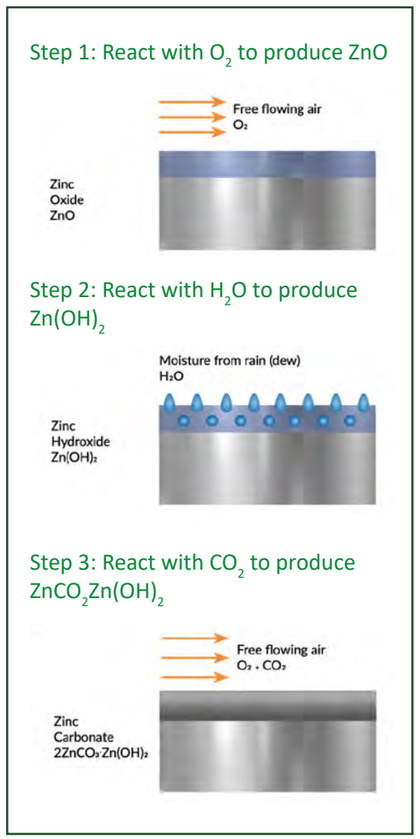
TEST RESULTS - RESISTANCE ABILITY TO WHITE RUST

TEST METHOD:

Salt Spray Test (SST); ISO 9227, JIS Z2371 ASTM B117: 5%NaCl, 35°C.
Sample surfaces are applied Chromated treatment.

SALT SPRAY TEST





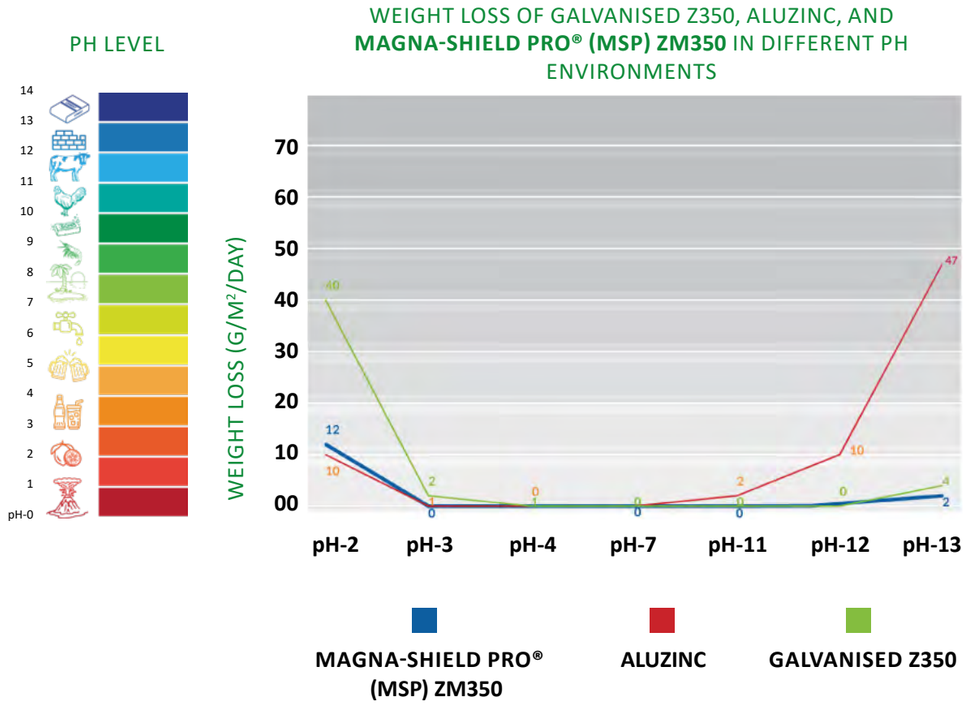
CONCLUSION:

Magna-Shield Pro®'s **(MSP) ZM350** white rust resistance ability is severely higher than Galvanised Z350. It is cleearly seen that the SKT layer formed in inhibiting the white rust formation process of zinc with Oxygen, Carbon Dioxide and water stream to create a white layer which is caused by a salt mixture of Carbonate ($ZnCo_3$) and Hydroxide ($Zn(OH)_2$).

TEST RESULTS - IN CHEMICAL ENVIRONMENT

TEST METHOD:

Comparison of the weight before and after soaking Aluzinc, Galvanised Z350 and **Magna-Shield Pro® (MSP) ZM350** in Na_2SO_4 solution at 30 degree Celsius after 24h; potential of hydrogen (PH) concentration increases progressively from 2 to 13 by adding H_2SO_4 or NaOH solution.



CONCLUSION:

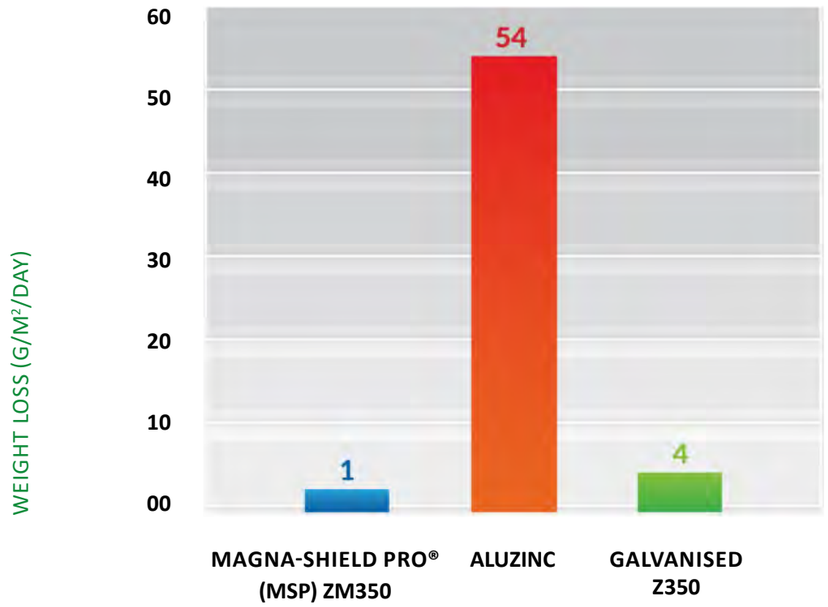
In acidic environments, Galvanised Z350 is corroded quite quickly while Aluzinc and **Magna-Shield Pro® (MSP) ZM350** are equivalently slower. However, in alkaline environment, corrosion is 50% lower than Galvanised Z350 and far superior than Aluzinc.

TEST RESULTS - IN AMMONIA ENVIRONMENT

TEST METHOD:

Comparison of weight before and after soaking Aluzinc, Galvanised Z350 and **Magna-Shield Pro® (MSP) ZM350** in 5% of NH_3 solution, at 30 degree Celsius after 24h

WEIGHT LOSS OF GALVANISED Z350, ALUZINC, AND **MAGNA-SHIELD PRO® (MSP) ZM350** IN DIFFERENT PH ENVIRONMENTS



CONCLUSION:

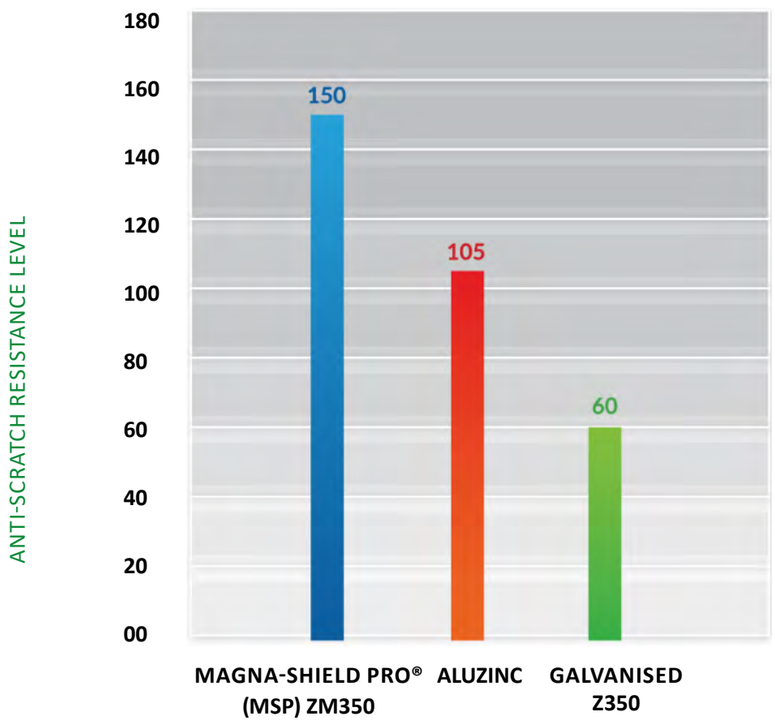
In the ammonia (animal breeding) environment, the corrosion resistance of **Magna-Shield Pro® (MSP) ZM350** is 3 times more resistant to ammonia attack than that of normal Galvanised Z350 and it is recommended that Aluzinc should not be used in the ammonia environment due to poor corrosion resistance.

TEST RESULTS - SCRATCH RESISTANCE ABILITY

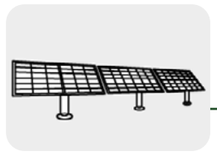
TEST METHOD:

Magna-Shield Pro® (MSP) ZM350 has a harder coating layer than Galvanised Z350 and Aluzinc. As a result, **Magna-Shield Pro® (MSP) ZM350** offers improved scratch resistance to reduce abrasion caused by processing and forming, transportation, storage or installation.

ANTI-SCRATCH RESISTANCE OF GALVANISED Z350, ALUZINC AND **MAGNA-SHIELD PRO® (MSP) ZM350** (CHECK FOR SCRATCHES LEVEL)

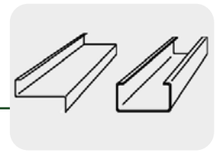


VICKER HARDNESS (HV)	
MAGNA-SHIELD PRO® (MSP) ZM350	140-160
ALUZINC	100-110
GALVANISED Z350	55-65



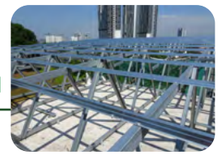
Solar farms

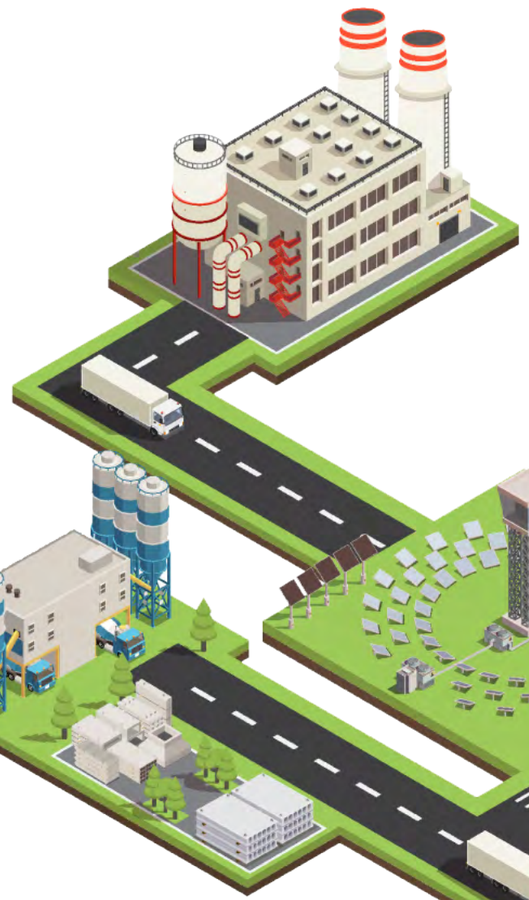
Purlins

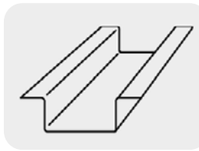


Purlins

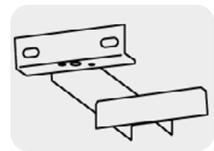
Junction Stud





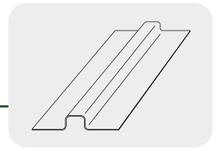


Junction Stud



Bridging

Facade System



Chemical Storage

Agricultural Facilities

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CORROSIVITY OF THE ENVIRONMENT – A QUICK GUIDE

Corrosivity in Australia as defined in AS/NZS 2312.2 and described in AS 4312				
Environment Definitions	**Distance from coast**	**Distance from source**	**Examples**	
Level	**Marine**	**Industrial**	**Indoor**	**Outdoor**
C1	In dry, heated or air conditioned building		Heated spaces with low relative humidity and insignificant pollution. Offices, schools, museums	Dry or cold zones with very low pollution or time of wetness. More than 50km from coast.
C2	Exterior location, or in non heated, non air conditioned building		Unheated spaces with varying temperature and humidity, low frequency of condensation and low pollution. Storage, sports halls	Atmospheric environment with low pollution. Rural areas or small towns and suburbia.
C3	From 1km to 20- 50km from ocean, or 100m to 1km of sheltered water	Several Km downwind of industrial plant	Spaces with moderate frequency of condensation and moderate pollution from industry. Food processing plants, laundries, breweries, dairies.	Medium pollution or some effect of chlorides. Urban areas, sheltered coastal areas
C4	From 200-300m to 1 km from ocean, or closer than 100m of sheltered water	Within 12km of industrial plant, or in damp humid building	High frequency of condensation and high pollution. Industrial processing plants, piggeries, poultry and cattle feedlots, swimming pools	High pollution or substantial effect of chlorides. Polluted urban areas or coastal areas.
C5	Offshore or up to 200-300m of ocean	Inside aggressive industrial plant	Spaces with very high frequency of condensation, and/ or high pollution from the production process. Mines, Caverns, unventilated sheds in tropical zones	Very high pollution with significant effect of chlorides. Industrial areas, coastal areas.

INDICATIVE ANTI-PERFORATION WARRANTY PERIODS

Category	Designlife (years)	Exposure Condition	Warranty (years)
C1	100+	Indoor	50
		Outdoor Washed	50
		Outdoor unwashed	40
C2	100+	Indoor	50
		Outdoor Washed	40
		Outdoor unwashed	30
C3	30 - 100	Indoor	35
		Outdoor Washed	20
		Outdoor unwashed	12
C4	15-30	Indoor	12
		Outdoor Washed	9
		Outdoor unwashed	6
C5	8 - 15	Indoor	6
		Outdoor Washed	4
		Outdoor unwashed	3

Notes: The standard warranty is initially only applicable for C1 to C3 environments. For C4 and C5 Environments, please consult with Millform for more information. Warranties for these environments / classifications are applied on a project specific criteria and may be up to the time periods indicated above.

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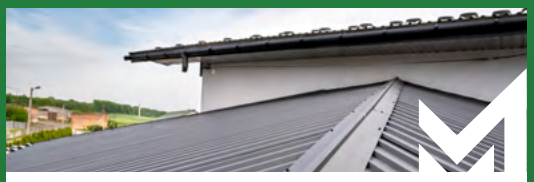
TOPHAT & BATTENS

PURLIN & CHANNEL

HOOKFAST PURLIN BRIDGING SYSTEM

ROOFING & WALLING



ROOFING ACCESSORIES

JUNCTION STUD & FACADE SYSTEM

CORROSION RESISTANT SYSTEM

MILLFORM OFFICE & MANUFACTURING FACILITY

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Version 1

SUSTAINABLE CERTIFICATION ✓ISO 9001

SUSTAINABLE CERTIFICATION ✓ISO 45001

BROCHURE