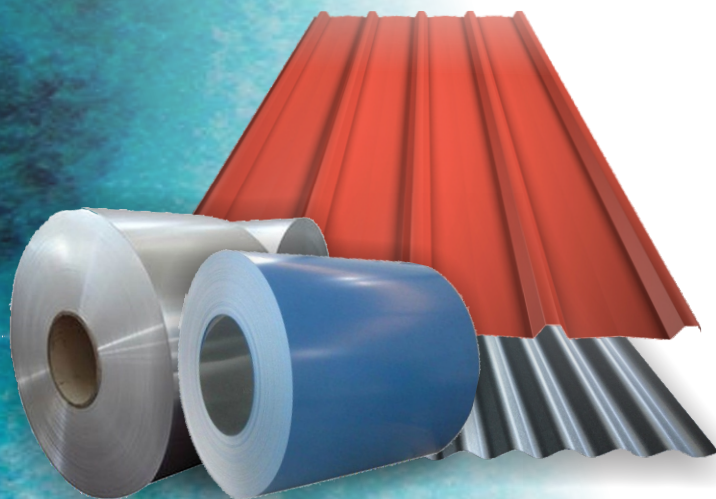




# MSP INFORMATION MANUAL

No: 4



Coated Steel Supplied By:



## MALDIVES STRUCTURAL PRODUCTS PVT. LTD

A Joint Venture of State Trading Organization & Rainbow Enterprises

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**Colorbond®**

**Zincalume®**

MSP SEADEK®  
 MSP WAVEDEK®  
 MSP GADHATEC®

**Duradek®**  
THE DURABLE ROOFING SHEET

MSP SEADEK produced from COLORBOND® XRW steel & ZINCALUME® steel

Manufactured by:

Distributed by:



**Maldives Structural Products Pvt. Ltd**  
 2nd Floor, Marlinespike Building,  
 Male', Rep of Maldives.  
 Tel: (960) 3337720, Fax: (960) 3337721  
 Email: msroof@dhivehinet.net.mv





Manufacturer of Roofing Products

# MSP ROOFING

## DISTRIBUTION OUTLETS

● STO ● RAINBOW ENTERPRISES / ● Dealers



## INTRODUCTION

Maldives Structural Products Pvt. Ltd (MSP) is a joint venture of State Trading Organization (STO) and Rainbow Enterprises.

Formed with the objective of providing quality and affordable roofing products to Maldivian market, MSP is the pioneer of roll forming roofing materials in Maldives for more than 15 years. Our products are well known for its quality and durability.

MSP has gained great reputation for manufacturing and providing quality roofing products to consumers, especially with our premium products such as **Colorbond** and **Zincalume**.

**Colorbond** and **Zincalume** are backed with extensive research to improve its performance and durability. It is a globally accepted material as a smart choice for roof and wall cladding applications due to its state-of-the-art metallic coating and long lasting paint technology.

Apart from its global recognition **Colorbond** and **Zincalume** has gained its trust among the Maldivians.

**Note-1:** Dealer information is up to date as of April 2017. Dealers status may change in the future.

**Note-2:** Published in April 2017.

# ROOFING PROFILES OF MSP

MSP produces two types of roofing sheets. The two profiles are **MSP SEADEK** and **MSP WAVEDEK**. The details of these profiles are given below.

## MSP-SEADEK<sup>®</sup>

**MSP-SEADEK** is the registered brand of the trapezoidal profile (Magu Fulhaa Tinu) produced by MSP. It has cover width of 740mm. The design and cover width is based on aesthetics, performance as well as handling convenience.

The long lasting and aesthetic qualities of the **SEADEK** products are due to the material used to manufacture them. MSP uses the world acclaimed **Colorbond** and **Zincalume** materials to produce **MSP-SEADEK** profile sheets.

**MSP-SEADEK** roofing products are available in the following materials:

- **Colorbond**
- **Zincalume**
- **Duradek**

For customers that prefer long lasting and durable solutions, **Colorbond** and **Zincalume** are the main options. It is noteworthy to mention **Colorbond** and **Zincalume** are trademark brands of **BlueScope Steel, Australia** and holds the quality assurance of **American Standard – ASTM A 755M**.

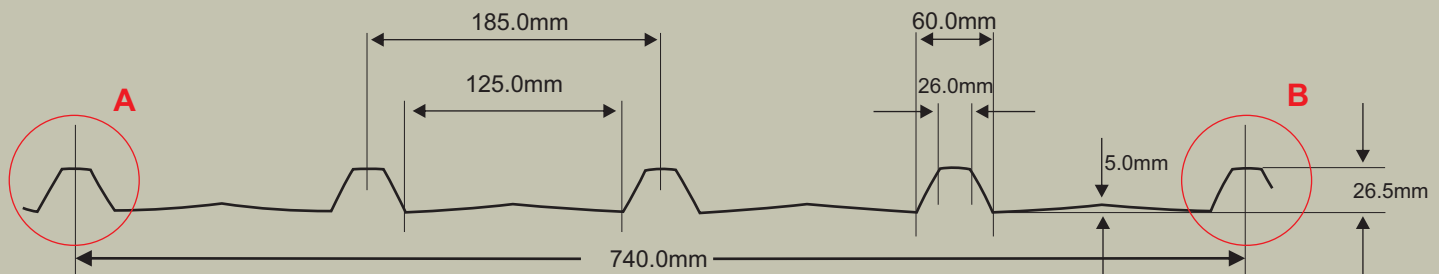


Fig.1 MSP-SEADEK profile details

## The Key Benefits of MSP-SEADEK Profile

**MSP-SEADEK** profile is designed in such a manner, the spacing of the ridges as well as the optimum cover width as illustrated in the fig.1 gives the roofing sheet additional strength and convenience in handling. The profile also allows wider purlin spacing.

### The Anti-Capillary Feature

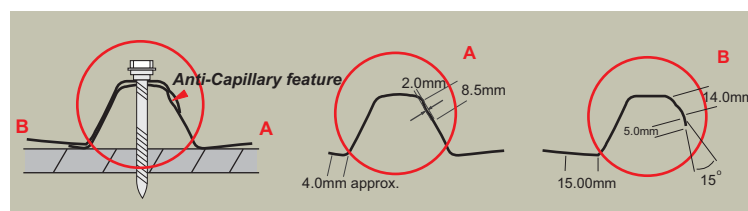


Fig.2 Illustration of MSP-SEADEK profile's Anti-Capillary feature

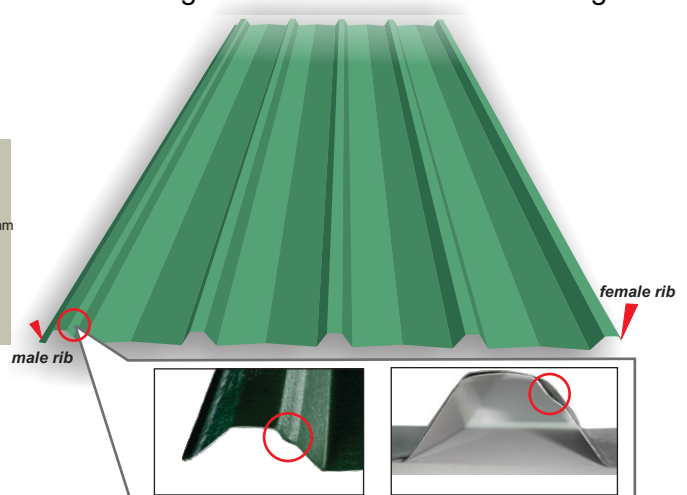


Fig.3 Illustration of MSP-SEADEK profile's Anti-Capillary feature

The Anti-Capillary feature prevents the water leakage along longitudinal lap by obstructing water seeping inside through capillary action.

# MSP-WAVEDEK<sup>®</sup>

**MSP-WAVEDEK** is the registered brand name of the sinusoidal profile produced by MSP. One of the distinctive feature of the **MSP-WAVEDEK** profile is extra cover width of 740mm (29 inches) compared to similar type roofing sheets available in the market.

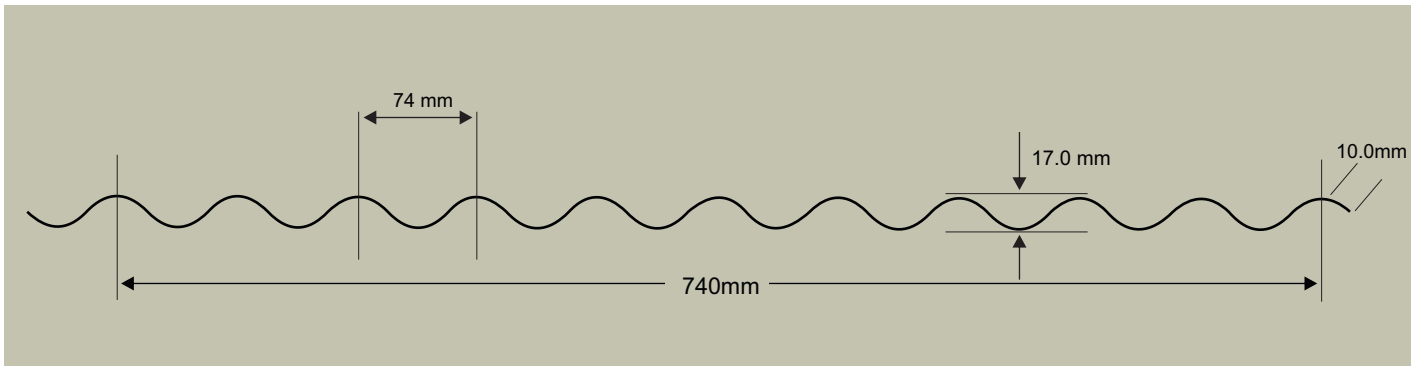


Fig. 04. Illustration of **MSP-WAVEDEK** profile

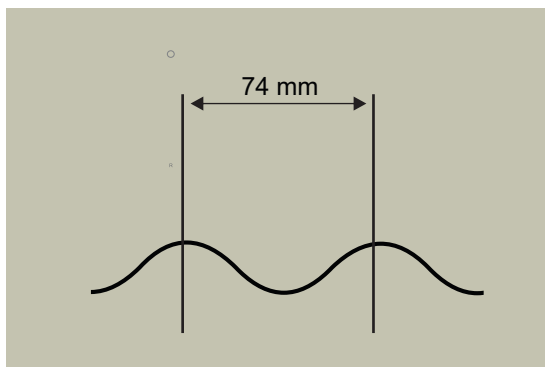


Fig. 05. Illustration of **MSP-WAVEDEK** profile

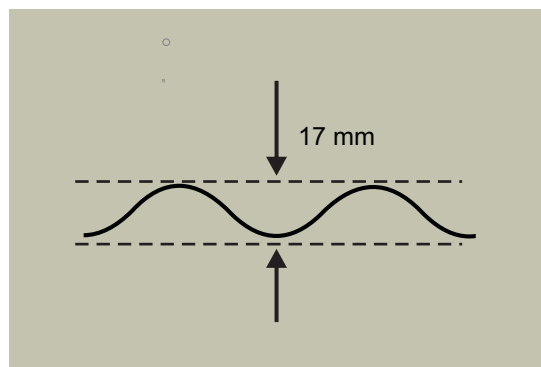
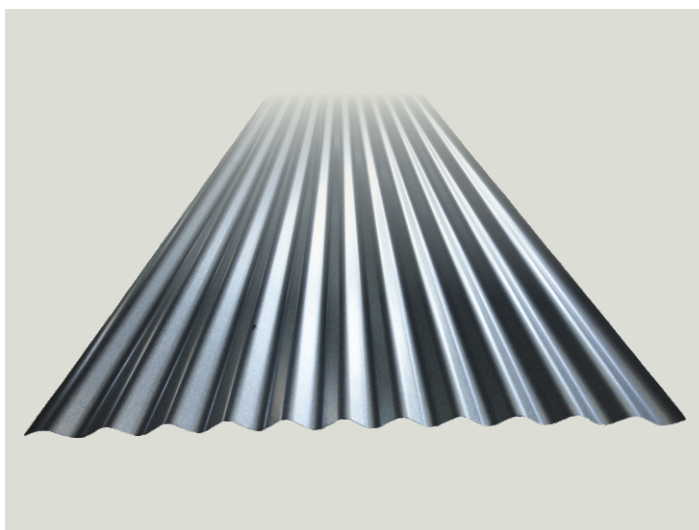


Fig.06. Illustration of **MSP-WAVEDEK** profile

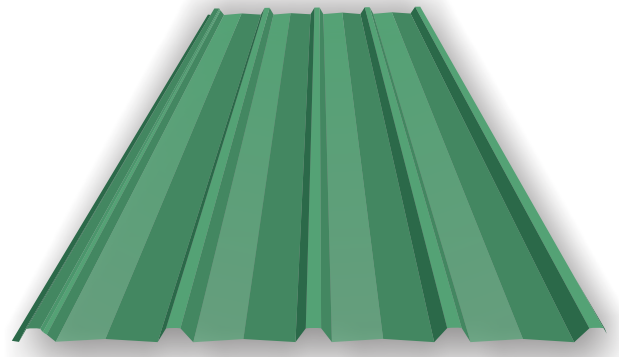
As shown in the Fig.05 and 06, the distance between the ridges and the height of the ridges give better strength which has advantage in handling and installation as well as durability.



# MATERIAL USED TO PRODUCE MSP-SEADEK AND MSP-WAVEDEK



**Colorbond** steel is a trademark brand of **BlueScope** steel Australia. It is manufactured using high quality steel with minimum yield strength of 550 Mpa, that makes it superior to similar alternatives available in the market. In Maldives, **Colorbond** steel is the most preferred choice for good quality roofing and cladding.



**Colorbond** steel has been specifically designed and developed for high durability as well as for better installation and can be used for roofing and wall cladding applications and are widely accepted in Maldives.

## Steel and Coating Properties

As shown in the below figure 7 and 8, the paint system of **Colorbond** steel uses stable inorganic pigments and especially developed resins for better paint performance. Moreover, absence of lead in the paint system makes it 100% suitable for **water harvesting** as well.

MATERIAL	COLORBOND XRW
Coating Class	AZ 150
Base Metal Thickness mm	0.42 mm
Total Coated Thickness mm	0.47 mm
Mass per unit area Kg/m <sup>2</sup>	4.35 kg/m <sup>2</sup>
Mass per unit length kg/m	3.025 kg/m
Paint Category	Ext Roofing and Walling
Top Colour	Standard Colours
Colour Thickness	25 micron
Reverse Colour	Shadow grey
Colour Thickness	10 micron

Fig.07 Material specification

### Coating Line

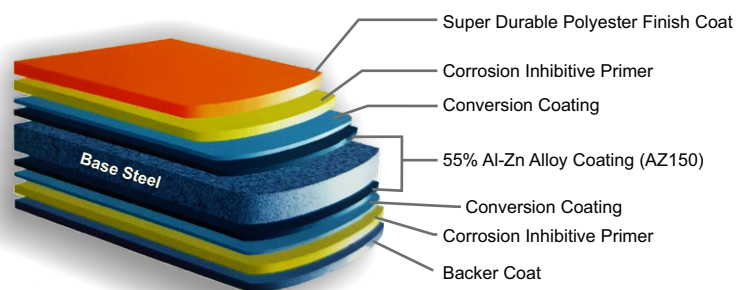
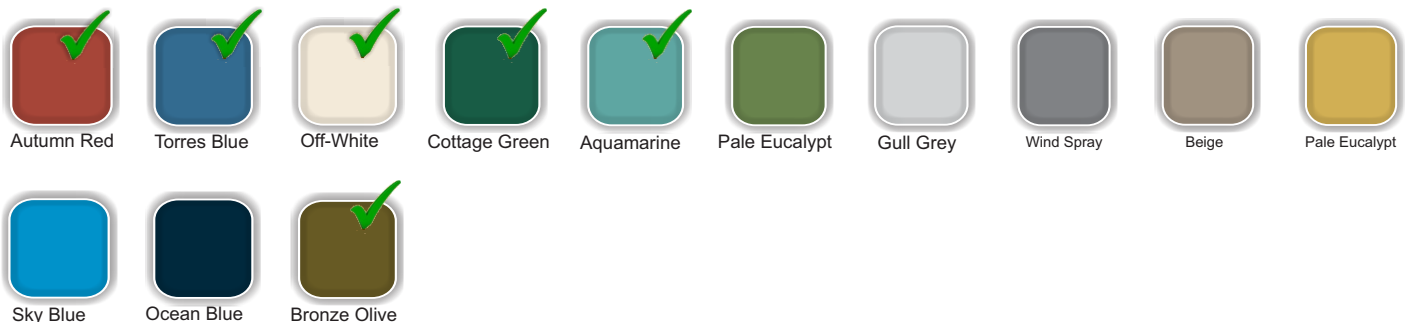


Fig.08 illustration of **Colorbond's** color coating line

## Standard Colors of COLORBOND Material



**Colors readily available with MSP.**

**Note:**

- Colors that are not held in stock can be supplied based on mutually agreeable terms
- The actual color may differ from what is shown above

## Colorbond roofing compared to normal color coated steel

The superior paint system of **Colorbond** steel gives it long life, aesthetics and excellent corrosion resistance. Fig. 9 and 10 are examples from Maldives.

From the figure 9 we can see that the top roof of the building is installed with **Colorbond** steel but the bottom roof is installed with low-standard ordinary roof. We can clearly see the extent of the color fading from the bottom roof in comparison with the top **Colorbond** roof.

The reason is due to **Colorbond's** tested stable resin and inorganic pigments that do not break down as a result of UV radiation, thus resisting fading, chalking and giving a remarkable color stability when exposed to such conditions.

Figure 10 shows a typical low cost roof installed just adjacent to the **Colorbond** roof (right). It can be clearly seen the extent of color fading as well as cut-edge corrosion.

However **Colorbond** roof's cut-edge remain smooth and free from any stain or corrosion due to its remarkable **Cut-Edge Protection** system.



Fig.09 Illustration of **Colorbond's** durability comparison to other materials.



Fig.10 Illustration of **Colorbond's** durability comparison to other materials.

## High Yield Strength

The high yield strength of **Colorbond G550 (High-Strength Steel)** makes it suitable for various applications requiring durability and long service life.

When compared to low standard roofing sheets, **Colorbond** sheets have greater resistance to dents and damages.

As shown in figure 11, wider spans with lesser thickness are possible due to the high concentration of Aluminum (55%) which makes 80% of the coating volume in the **Colorbond** material.

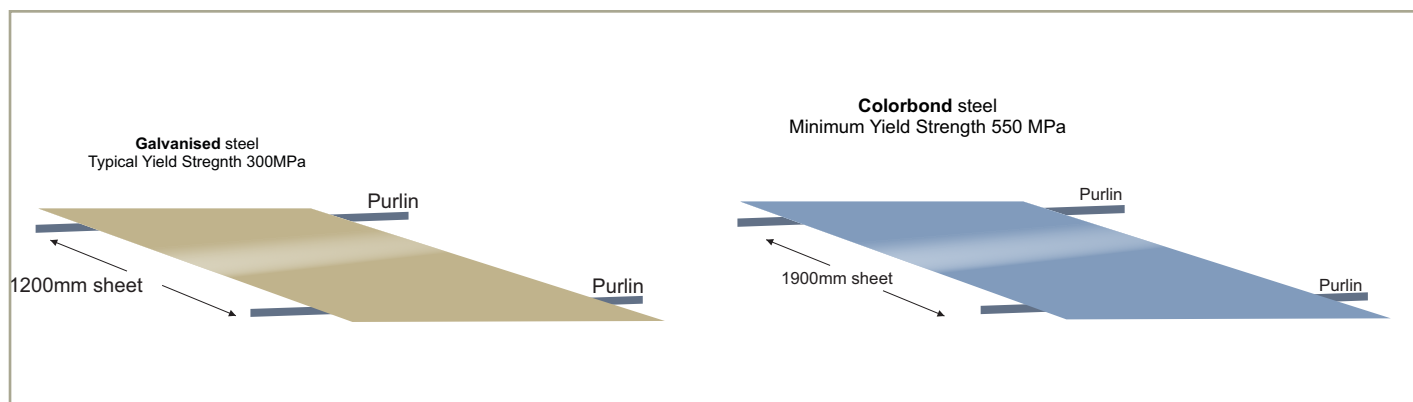
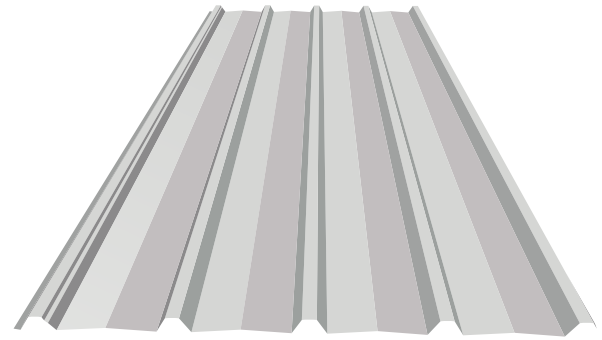


Fig.11 Comparison of purlin spacing of **Colorbond** & **Galvanized** steel

# Zincalume®

**Zincalume** steel is a premium product developed by **BlueScope** Australia. Unlike the Galvanized steel (which is only Zinc coated), **Zincalume** steel stands out due to its remarkable inherent attribute of **Zinc-Aluminium alloy coating** characteristics which gives it a longer life four times the galvanized steel.



**Zincalume** steel is widely used in construction industry where long life is crucial. It can be seen in projects around the world where it has been successfully used for roofing and wall applications. The unique attribute of the **Zincalume** steel is the material's inherent **High-Strength Steel**. To further elaborate, fig.14 (next page) clearly illustrates the corrosion protection mechanism of **Zincalume** steel.

## Material Detail

As shown in the figure-12 and 13 the base steel of the of **Zincalume** is protected with the **Zinc-Aluminium alloy** coating which gives both Zinc protection and barrier protection of Aluminium.

To further strengthen, a special passivation treatment coating is laid, which extensively reduces the rate of oxidation and resultant discoloration. The resin coating on top gives a smooth and glossy finish and resistance to early corrosion with heat reflectivity due to its shiny surface.

MATERIAL	ZINCALUME
Coating Class	AZ 150
Base Metal Thickness mm	0.35 mm
Total Coated Thickness mm	0.40 mm
Mass per unit area Kg/m <sup>2</sup>	3.567 kg/m <sup>2</sup>
Mass per unit length kg/m	3.2.667 kg/m <sup>2</sup>
Properties of Base Steel	C (0.2%), P (0.04%), Mn (1.2%), S (0.03%)
Yield Strength, Mpa	G550
Tensile Strength, Mpa	G550
Coating Adhesion-180 Bend	2t

Fig.12. Material specification

## Coating Line

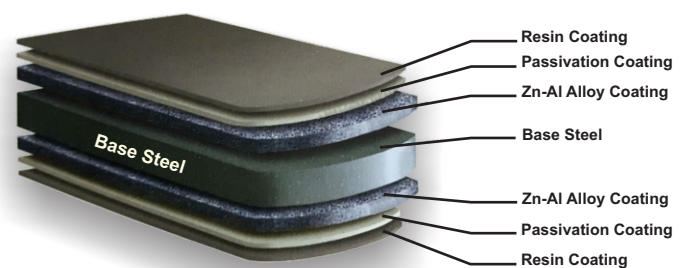
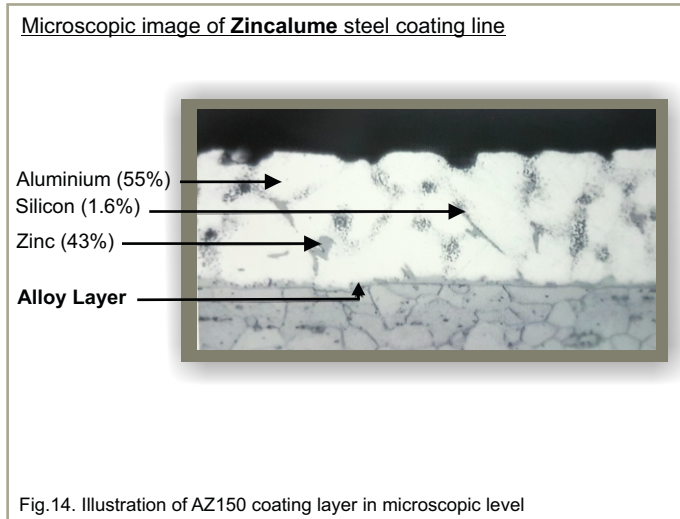


Fig.13. Illustration of **Zincalume** steel coating line



## Corrosion Protection Mechanism

The **Zincalume** steel's success for corrosion resistance is best illustrated in the below photomicrograph (Fig.14). The Zinc rich region is locked in micro pockets within the aluminum rich matrix. This addition of Aluminum alloy coating and the way it melds with the zinc coating provides three key benefits:



**1-** Aluminium has always been known to have excellent anti corrosion properties. Thus, to realize the full benefit of aluminium it needs to be evenly spread across the strip and equally distributed with the zinc coating.

**2-** The zinc coating plays crucial role if the sheet is scratched or the edge is exposed, zinc will sacrifice itself and protect the exposed edge until it is consumed entirely.

**3-** The adjacent pockets of zinc rich areas are in electrical contact with the steel and they are then activated to provide continual galvanic protection.

## Compatibility

The forces of nature are constantly at work contributing to the corrosion of the roofs. The **Zincalume** steel has been monitored for its performance across a wide range of climate conditions using exposure tests.

By harnessing the findings of these testings, and with continuous research and development, **Zincalume** steel ensures that it is able to withstand harsh environments even in the SAARC region for longer period and it performs remarkably well in Maldivian environment.

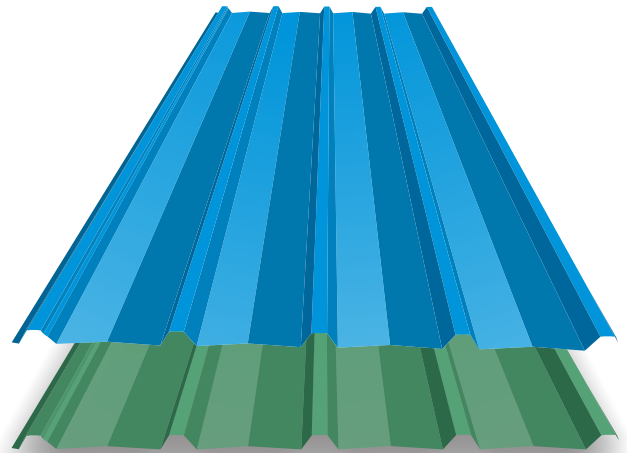
With its remarkable performance of AZ150 (Zinc Aluminium Alloy Coating) and G550 steel (High Strength Steel), customers can be confident that they have the right solution for their project.





**Duradek** is a new material for roofing and cladding that has been developed for customers looking for a more economical solution.

It is a material produced with **Zinc-Aluminum Alloy Coating** with an attractive color finish. However, **Duradek** has a lower coating class than **Colorbond** and **Zincalume**.



## Material Detail

MATERIAL	DURADEK
Coating Class	AZ 70
Total Coated Thickness	0.40 mm
Base Metal Thickness mm	0.38 mm
Properties of Base Steel	C (0.2%), P (0.04%), Mn (1.2%), S (0.03%)
Yield Strength, Mpa	G550

Fig.15. Material specification

## Coating Line

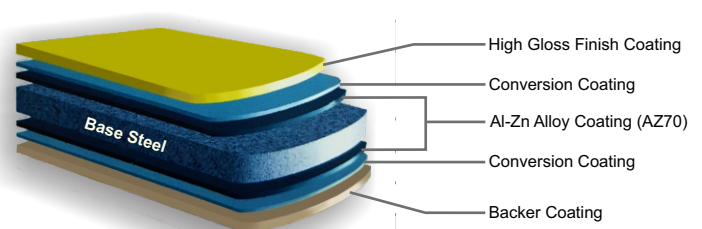


Fig.16. Illustration of **Duradek** coating line

As depicted in the figure 16, the **Duradek** steel is coated with Zinc-Aluminum alloy coating (AZ 70) with a lower class grade than of **Colorbond** and **Zincalume** material. Another layer of conversion coating is applied on the surface to enhance the resistance to early corrosion and the high gloss finish coating gives the **Duradek** a smooth and satin finish.

## Standard Colours



**Lagoon Green**



**Lagoon Blue**

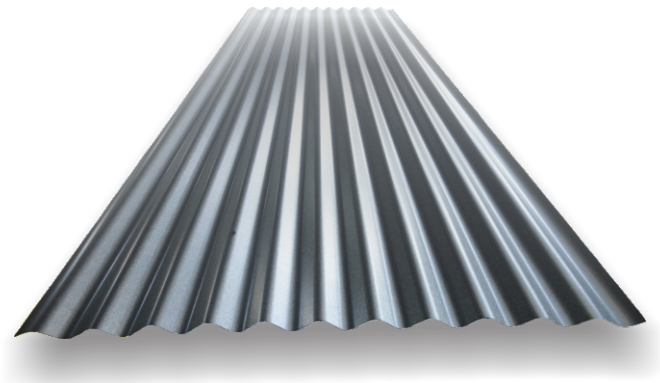


# MSP GADHATEC<sup>®</sup>

**MSP-GADHATEC** is produced by MSP for the benefit of those who look for quality roofing material at an affordable price. **MSP-GADHATEC** is made from **Zinc-Aluminium Alloy** coated steel which lasts four times longer than regular galvanized steel.

## Material Detail

The **Gadhatec** material comprises of three types of coating, Az-120 which protects the base steel from early corrosion. Further, a conversion and a resin coating is distributed equally on the surface to protect the steel from harsh UV rays and enhances the durability of the **Gadhatec** steel.



MATERIAL	GADHATEC <sup>®</sup>
Coating Class	Az120
Total Coated Thickness	0.38 mm
Base Metal Thickness mm	0.40 mm

Fig.17. Material specification

## Coating Line

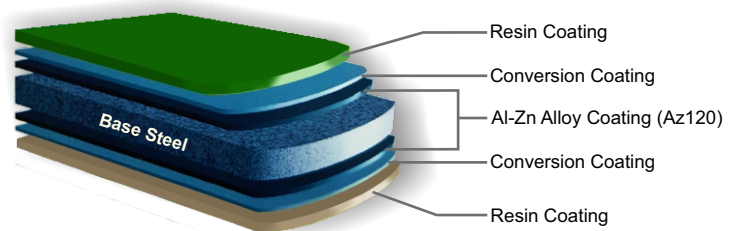


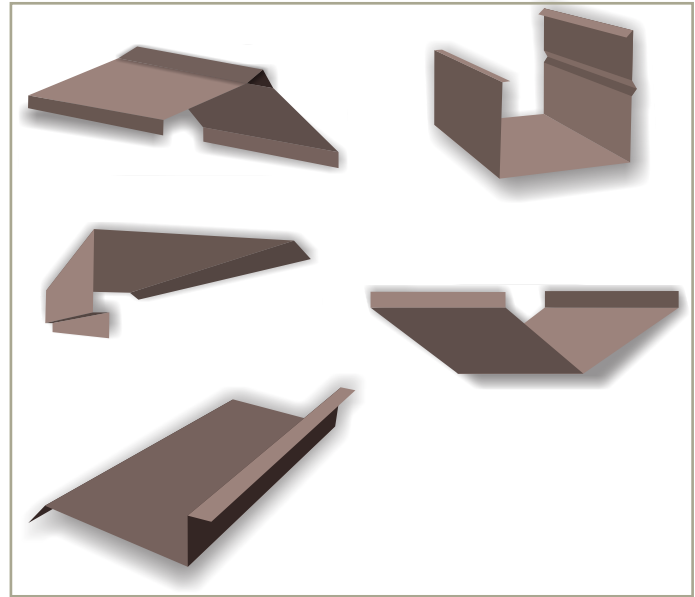
Fig.18. Illustration of **Gadhatec** coating line



# ROOFING ACCESSORIES

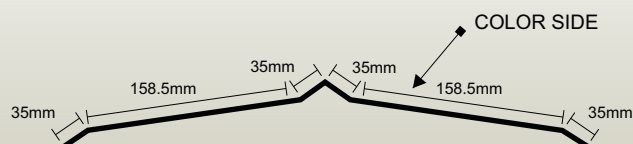
MSP produces roofing accessories such as ridge capping, apron flashing, fascia gutter, flashing and valley gutter. The standard sizes that are produced are shown below.

The accessories can be produced with any material available with MSP. Non-standard sizes as well as other types of roofing accessories can be produced on request.

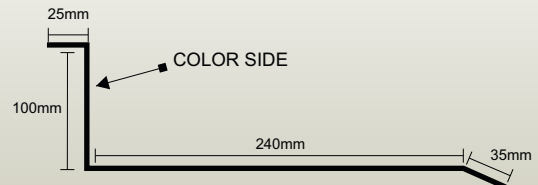


## Standard Types and Sizes of Roofing Accessories

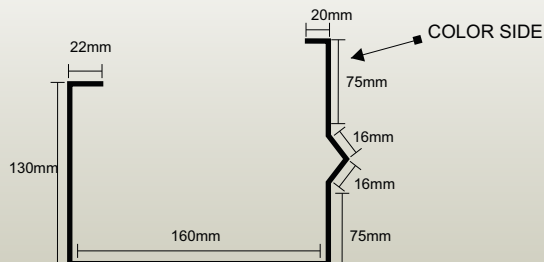
### 1. RIDGE CAPPING



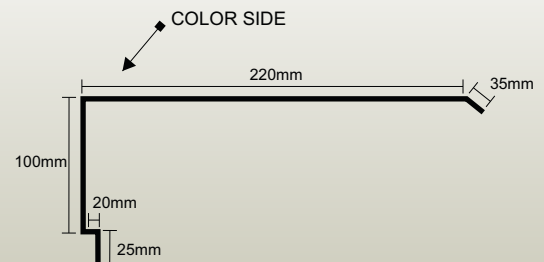
### 2. APRON FLASHING



### 3. FASCIA GUTTER



### 4. FLASHING



### 5. VALLEY GUTTER



Fig.19. Illustration of sizes & types of roofing accessories.

# INSTALLATION AND RECOMMENDATION FOR FASTENING

## Installation

### Laying Procedure

For maximum weather-tightness, start laying sheets from the end of the building that will be in the lee of the worst anticipated or prevailing weather.

It is much easier and safer to turn sheets on the ground than up on the roof. Before lifting sheets onto the roof, check that they are correct way up and the overlapping side is towards the edge of the roof from which installation will start as shown in the figure-20.

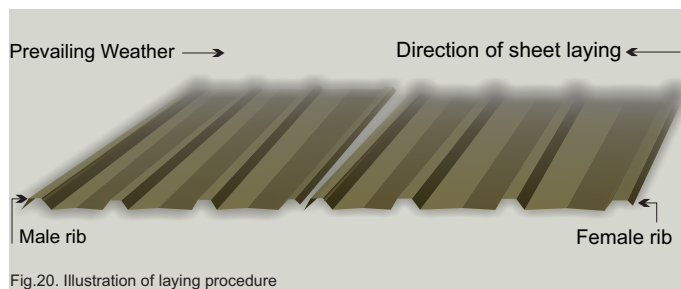


Fig.20. Illustration of laying procedure

### Compatibility

Lead, copper, bare steel and green or some chemically treated timbers are not compatible with this product; thus don't allow any contact of the product with those materials, nor discharge of rainwater from them onto the product.

### Cutting sheets on site

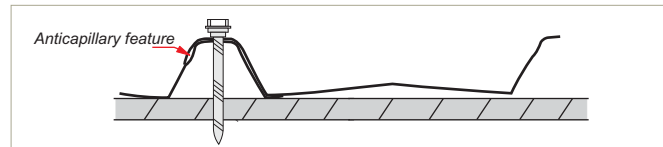
For cutting thin metal on site, we recommend a circular saw with metal cutting blade as shown in the figure-21 because it produces fewer damaging hot metal particles and leaves less resultant burr than a carborundum disc. Cut materials over the ground and not over other materials. Sheets should be protected from swarfs.



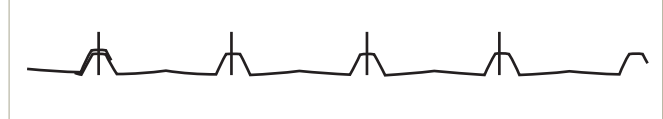
Fig. 21. For cutting thin metal on site, we recommend a circular saw with metal cutting blade

### Fastening Procedure

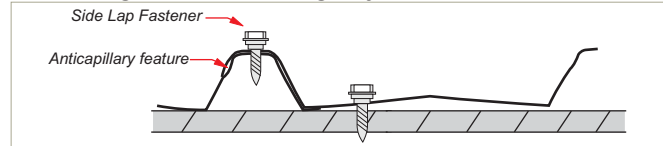
#### Crest fixing to steel for Roofing only



4 Fasteners per sheet - All supports



#### Crest fixing to steel for Walling only



4 Fasteners per sheet - All supports

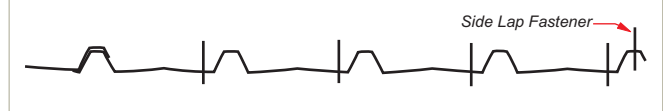


Fig.22. Illustration of fastening

### Recommended Fastner

	Directly to Support	With insulation blanket
<b>Timber Supports</b>		
<b>Grade:</b> Hardwood	No. 12-11 x 65 mm Hex head type 17 self drilling screw with seal or bonded washer	No. 14-10 x 75 mm Hex head type 17 self drilling screw with seal or bonded washer
Softwood	No. 14-10 x 75 mm Hex head type 17 self drilling screw with seal or bonded washer	No. 14-10 x 75 mm Hex head type 17 self drilling screw with seal or bonded washer
<b>Steel Supports</b>		
<b>Thickness:</b> Up to 4.5 mm	No. 12-14 x 45 mm Hex head self drilling and tapping screw with seal or bonded washer	No. 12-14 x 50 mm Hex head self drilling and tapping screw with seal or bonded washer
Exceeding 4.5 mm	Tek 5 No. 12-24 x 50mm Hex Head self drilling and tapping screw with seal or bonded washer	Tek 5 No. 12-24 x 50mm Hex Head self drilling and tapping screw with seal or bonded washer



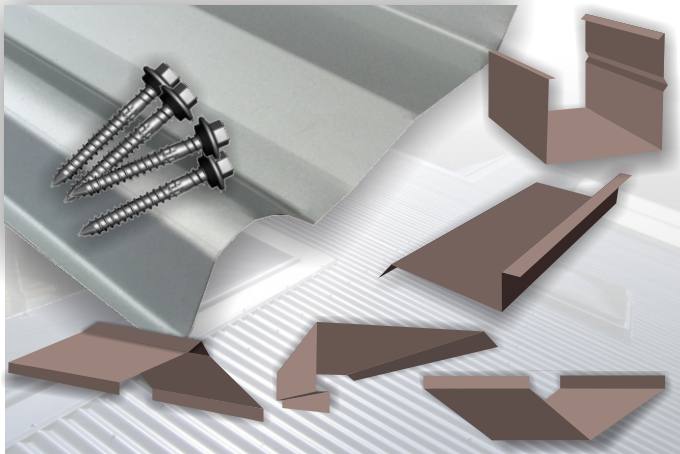
Fig.23. Recommended fasteners

# MAINTENANCE AND STORAGE

## Maintenance

Regular washing of areas that are not exposed to rain will enhance the expected life and the attractiveness of the painted finish for a longer period of time.

Touch up paints should be avoided as it creates patches of uneven colorings. If a sheet is badly scratched, it should be replaced immediately. Any debris (e.g. swarf, surplus fasteners) should be carefully removed at the completion of work each day, to minimize the risk of localized corrosion.



## Compatibility with Accessories

Gutter, flashing, ridge capping shall always be manufactured out of the same coating system used for main roof and wall cladding to ensure equal durability.

Extra attention shall be given for the material selection of gutter. Test results shows that **Zincalume** and **Colorbond** steel performs far better than galvanized steel when used for gutter and down-pipe applications.

## Storage

**MSP SEADEK** and **WAVEDEK** products are best stored clear of the ground. **SEADEK** products such as **Zincalume** and **Colorbond** steel if remains wet whilst stacked, storage corrosion may result.

However, the passivation treatment used with **Colorbond** and **Zincalume** steel, which includes organic resins decrease this risk.

Nevertheless, it is strongly recommended that the mentioned storage practice be followed to ensure the durability of the product.

- **Keep it Dry.**
- **Keep it under cover to prevent water condensation from accumulating between sheets.**
- **Raise it at one end to ensure good drainage.**



# The Authorised Dealers of MSP:



## State Trading Organisation Plc

STO Construction Shop: 3012634, 3012637, 3012630

STO no.5 Warehouse: 3012418

STO Construction Office: 3012638

Email: [construction@stomaldives.net](mailto:construction@stomaldives.net)

[www.sto.mv](http://www.sto.mv)



## Rainbow Enterprises Pvt. Ltd

G. Maarana, Alikilegefaanu Magu, Male', 20129, Rep of Maldives

Tel: 3340400, 3316914

Fax: 3327374

Email: [sales@rainbow.com.mv](mailto:sales@rainbow.com.mv)

Web: [www.rainbow.com.mv](http://www.rainbow.com.mv)



The iconic **Zincalume** steel with 55% Al-Zn Alloy coating and **Colorbond** steel, the world's most advanced pre-painted steel are now manufactured in India by Tata BlueScope Steel. These globally proven and best-in-class products have superior corrosion resistance with a longer life span.

Zincalume steel comes with a 150g/m<sup>2</sup> (Az150) metallic coating that lasts up to 4 times longer than Galvanised steel with 275 g/m<sup>2</sup> (Z275) of Zinc coating in near neutral environmental conditions.

Similarly, **Colorbond** steel is made up of superior paint system that contains inorganic pigments, which ensures color durability. The absence of lead in the paint system also makes it suitable for rain water harvesting.



**Maldives Structural Products Pvt. Ltd**  
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 Email: msroof@dhivehinet.net.mv